Target National Account
EnergyX® System
Factory Installed Energy Recovery
48/50HC WeatherMaster® Commercial Rooftop Units
20 and 25 Nominal Ton Units
with Puron® (R--410A) Refrigerant
and I/O Flex 6126 Controls

Carrier
turn to the experts

Supplemental Installation Instructions

This document is a supplemental installation instruction for Target rooftop units with the EnergyX factory installed Energy Recovery Ventilator. It is to be used with the base HC 20 & 25 Ton rooftop unit Installation Instructions.

NOTE: Read the entire instruction manual before starting the installation

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SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock or other conditions which may cause personal injury or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloths for brazing operations and have a fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions attached to the unit. Consult local building codes and appropriate national electrical codes (in USA, ANSI/NFPA70, National Electrical Code (NEC); in Canada, CSA C22.1) for special requirements.

It is important to recognize safety information. This is the safety-alert symbol ⚠. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, CAUTION, and NOTE. These words are used with the safety-alert symbol.

DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards which **could** result in personal injury or death.

CAUTION is used to identify unsafe practices, which **may** result in minor personal injury or product and property damage.

NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could cause personal injury or death.

Before performing service or maintenance operations on unit, always turn off main power switch to unit and install lock(s) and lockout tag(s). Unit may have more than one power switch. Ensure electrical service to rooftop unit agrees with voltage an amperage listed on the unit rating plate.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may cause equipment damage.

This unit uses a microprocessor-based electronic control system. Do not use jumpers or other tools to short out components or to bypass or otherwise depart from recommended procedures. Any short-to-ground of the control board or accompanying wiring may destroy the electronic modules or electrical components.

⚠ CAUTION

CUT HAZARD

Failure to follow this caution may result in personal injury.

Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing, safety glasses and gloves when handling parts and servicing air conditioning equipment.

GENERAL

This publication contains Installation, Start-Up, Controls, Operation, Troubleshooting and Service information for the EnergyX Energy Recovery System, factory installed on a 48/50HC (20 to 25 nominal ton) rooftop unit. This document is a supplemental installation instruction and is to be used in conjunction with the base rooftop unit Installation Instructions..

The EnergyX Energy Recovery system is designed to pre-condition the outside air prior to it entering the rooftop unit evaporator using building exhaust air as a heat sink / source. The EnergyX system provides latent and sensible energy exchange between the outside ventilation air and the building exhaust air. This preconditioning of air allows higher operating efficiencies, increased comfort control, potential downsizing of the base rooftop unit while still meeting the ASHRAE ventilation requirements. Operational cost savings are realized by the high efficiency Energy Recovery device meeting the cooling and heating call for a larger portion of the operating cycle than just a normal damper or economizer device. This is demonstrated by the EnergyX AHRI Guideline-V Combined Efficiency Factor.

EnergyX HC24-28 units are shipped in the vertical supply and return duct configurations only. A field installed horizontal curb adapter kit is available for horizontal return and supply configuration.

The EnergyX Energy Recovery Wheel is rated in accordance with AHRI 1060 and is UL listed.

See Table 1 for Physical Data.

Physical Data

Table 1 – Physical Data

Model	48/50HC 20 - 25 Ton
EnergyX Unit Type	Modulating Air Flow Capability
ERV WHEEL OA (CFM) Range	3,000
ERV WHEEL EA (CFM) Range	2,500
ENERGY RECOVERY WHEEL	
TYPE	Enthalpy Lightweight Polymer with Silica Gel Desiccant Coating
MODEL (AirXchange)	ERC-3628C
SIZE (Dia. X Depth) (in.)	36–in x 3–in
NOMINAL DRIVE MOTOR HP	1/12
SUPPLY FAN #1	
QTY - TYPE	1 - Backward Curved Impeller
DRIVE TYPE	Direct
BLOWER SIZE (DIAMETER)	19.68 – in (500mm)
NOMINAL MOTOR HP	3.6
EXHAUST FAN #1	
QTY - TYPE	1 - Backward Curved Impeller
DRIVE TYPE	Direct
BLOWER SIZE	19.68–in (500mm)
NOMINAL MOTOR HP	3.6
FILTERS	
TYPE	2-in. Pleated, 30% Efficiency
SUPPLY AIR (QTY) - SIZE	(2) 20–in x 20–in x 2–in
EXHAUST AIR (QTY) - SIZE	(2) 20–in x 20–in x 2–in
TYPE	Aluminum Water Filter
Water Entrapment (QTY) - SIZE	(2) 34.375–in x 24.5–in x 1–in

INSTALLATION

An EnergyX unit is installed as a single piece unit. To install an EnergyX unit, follow the base rooftop unit installation instructions with the following exceptions and additions:

Install Roofcurb

Vertical Airflow Configurations —

The EnergyX unit uses the standard HC base unit roofcurb. No extra curb support rails or extensions are required. See the unit nameplate for model number designation. Refer to the base rooftop installation manual and "Install Hold Down Brackets" below for roofcurb instructions. Ductwork must be attached to the curb.

Horizontal Airflow Applications —

EnergyX units with a horizontal return and supply air configuration require a field installed horizontal curb adapter kit. Refer to the base rooftop installation manual and the horizontal curb adaptor kit manual for roofcurb instructions.

Rig and Place Unit on Curb

Inspect the EnergyX system for damage. File a claim with the shipping company if shipment is incomplete or damaged.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage.

All panels must be in place when rigging. Unit is not designed for handling by fork truck.

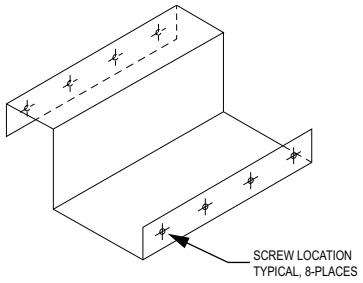
Install Hold Down Brackets —

Target curbs and curb adapters include hold down brackets provided by the roof curb manufacturer. Brackets must be installed on curb and attached to unit base rails. See Fig. 1 for details

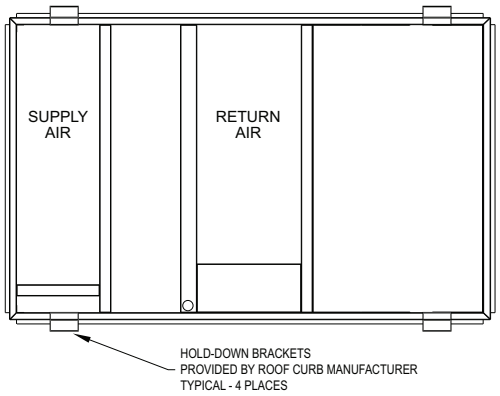
If using EnergyX unit with a curb adapter, the curb adapter must be secured to existing curb, and the curb adapter secured to the unit with hold down brackets.

See the rigging label on the exterior of the base unit and Fig. 2. This label is provided for guidance purposes ONLY. The unit's actual weight and center of gravity will vary based on the specific combination of factory options included with the unit. Use prudent judgment when rigging and lifting the unit to account for weight variances and make adjustments for the actual center of gravity as necessary.

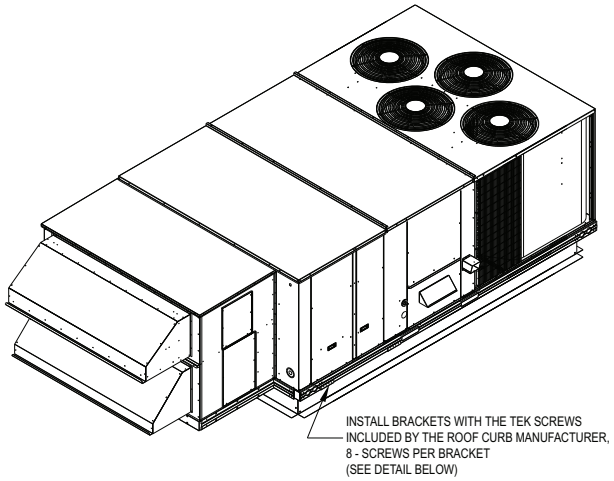
NOTE: Hold-down brackets must be affixed to the curb and rooftop unit prior to removing rigging support.



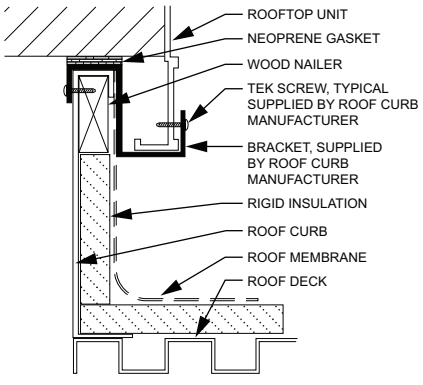
RTU HOLD-DOWN BRACKET



BRACKET LOCATION ON ROOF CURB



BRACKET INSTALLATION TO BASE RAIL



DETAIL: RTU HOLD-DOWN BRACKET INSTALLATION

C13023

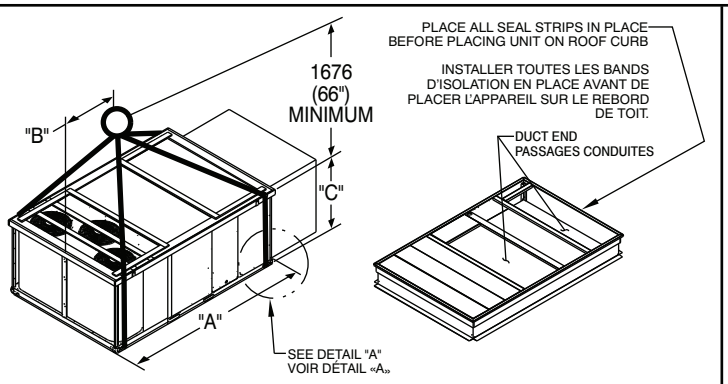
Fig. 1 - MRT ERV Hold Down Brackets — Location and Installation

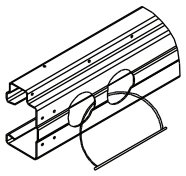
⚠ CAUTION - NOTICE TO RIGGERS:
⚠ AVERTISSEMENT - REMARQUE À L'ATTENTION DES MONTEURS

ALL PANELS MUST BE IN PLACE WHEN RIGGING.
TOUS LES CAPOTS DOIVENT ÊTRE EN PLACE AVANT LE LEVAGE

UNIT IS NOT TO BE RIGGED WITH CHAINS THROUGH BASE RAIL HOLES.
NE PAS PASSÉ LES CHAINES AU TRAVERS LES TROUS DU GLISSIÈRE DE BASE POUR GRÉE L'UNITÉ

- **Hook rigging shackles through holes in base rail, as shown in detail "A".**
- **Holes in base rails are centered around the unit center of gravity.**
- **Use wooden top skid, when rigging, to prevent rigging straps from damaging unit.**
- **Accrocher les manilles des élingues de levages dans les trous situés dans le rail de base comme indiqué au détail « A ».**
- **Les trous pratiqués dans le rail de base sont centrés autour de centre de gravité de l'appareil.**
- **Utiliser des cales en bois lors du levage pour éviter que les élingues n'endommagent le haut de l'appareil.**





DETAIL "A"
DÉTAIL «A»

UNIT	MAX. WEIGHT POIDS MAXIMUM		A		B		C	
	LB LIVRES	KG KG	IN PO	MM MM	IN PO	MM MM	IN PO	MM MM
48HC17 WITH ERV	3694	1679	127.8	3249	89.7	2277	52.3	1328
48HC20 WITH ERV	3904	1775	141.5	3595	92.4	2348	52.3	1328
48HC24 WITH ERV	4259	1936	141.5	3595	98.9	2512	60.3	1532
48HC28 WITH ERV	4304	1956	157.8	4007	105.0	2667	60.3	1532
50HC17 WITH ERV	3567	1621	127.8	3249	89.7	2277	52.3	1328
50HC20 WITH ERV	3777	1717	141.5	3595	93.2	2369	52.3	1328
50HC24 WITH ERV	4132	1878	141.5	3595	93.2	2368	60.3	1532
50HC28 WITH ERV	4177	1899	157.8	4007	105.8	2688	60.3	1532
48HCD*24*****-T	3623	1647	141.5	3595	94.9	2409	60.3	1532
48HCD*28*****-T	3668	1667	157.8	4007	106.6	2709	60.3	1532
50HC**24*****-T	3479	1581	141.5	3595	95.9	2435	60.3	1532
50HC**28*****-T	3524	1602	157.8	4007	107.7	2735	60.3	1532

50HE502615 D

NOTE: Units with "*****-T" in the model number are for Target only!

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Fig. 2 - Rigging Label, 48-50HC Size 24-28 Units With ERV

Positioning

Maintain unit clearances as listed as shown in Fig. 3 for minimum distance from combustible materials, proper airflow, and service access. Follow all local codes for proper clearances – the local code requirements take precedence over any clearance listed in this document. Contact your local Carrier representative for clearance obstructions and any potential resulting affect on unit warranty.

Follow all other curb, rigging, and positioning installation guidance in base rooftop unit installation instructions.

Exhaust Hood —

To meet certain specific codes, some 25 ton units (those going to Target stores within the U.S.) have corrugated plastic panels covering the ends of the exhaust hood. The panels are for shipping only. Remove the panels for unit operation, allowing exhaust to exit the sides of the hood.

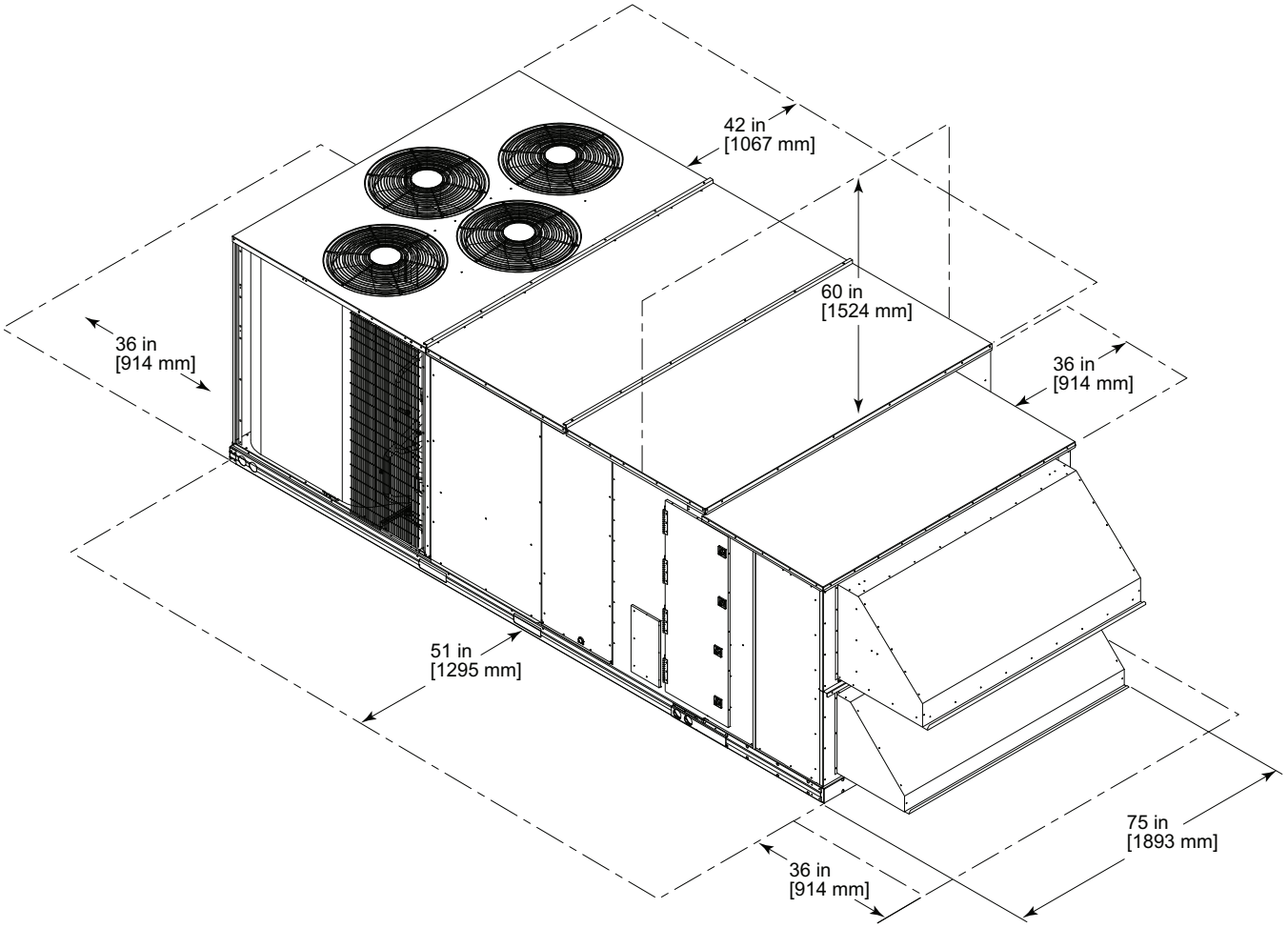

Fig. 3 - Clearances for ERV on Size 24 & 28 HC Base Unit

Make Electrical Connections

See the base unit name plate for the ETL certified singlepoint electrical values and component electrical information. See the base unit control box and EnergyX access doors for the electrical wiring diagrams specific to each section.

Main Power —

Follow all base unit installation instructions, using electrical values shown on unit nameplate; only one main power supply is required The EnergyX base rooftop unit and energy recovery module is ETL listed as a single point power supply only.

On some voltage ERV's, there is a step down transformer that is factory supplied to power components that are not line side voltage. Field wiring or alteration of these components is neither required nor desired.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage.

Some electric heat modules require a dual-point electrical service connection independent from all other electrical circuits in the unit. Consult the unit installation instructions, unit wiring diagrams and/or electric heater installation instructions for verification.

Control Power —

Follow all base unit installation instructions for low voltage wiring. The ERV control board is factory wired into the base unit communications. All external control wires still connect to the RTU terminal strip as in the base unit installation instructions.

See Appendix D of this manual for details on connections for the I/O Flex 6126 controller.

Base Unit Components

Follow the base unit installation instructions to install all other base unit components, including (but not limited to) flue hoods, condensate trap and other accessory devices.

START UP

The EnergyX unit is operated in coordination with the base rooftop unit. Follow the base unit instructions and Controls book for proper start-up with addition of the following:

Start-Up Check List

Use the EnergyX Start-Up checklist (see page 63) in conjunction with the base unit Start-Up checklist from the base Controls book. Fill in all blank data entries that are applicable to the exact unit being installed. The ERV model and serial numbers are printed in the ERV control box. Save the checklist for future service and maintenance use. It is recommended that a copy of the checklist be left with the unit in the literature slot on the base unit control box access door.

Base Unit Evaporator Fan

First follow the base unit instructions to balance the RTU indoor fan. The ERV fans should be off during base unit fan set-up. Before start-up and testing the ERV, verify that the minimum damper positions are set to 0 and if not change them to 0.

OPERATING SEQUENCE

General

An EnergyX unit is a 48/50HC rooftop unit and energy recovery ventilator (ERV). It operates the ERV module in an integrated manner with the base rooftop unit. The base rooftop unit functions per the base unit sequence of operation. The ERV will operate based on communication from the I/O Flex 6126 controller. The following section discusses the ERV operation in detail. In summary, the ERV operates to provide pre-conditioned outside air for ventilation requirements.

In general the ERV monitors occupancy and indoor fan state of the base unit to determine when to activate. The outside air fan bring in outside air which passes it through the enthalpy wheel and into the rooftop unit. The building return air is pulled through the enthalpy wheel by the exhaust fan and released outside. During operation the enthalpy wheel is rotating to use the building air to pre-condition the outside air.

IMPORTANT: Refer to Appendix D for details on the I/O Flex controller for the EnergyX system.

Communication

The ERV relies on communication with I/O Flex 6126 to operate. The ERV monitors I/O Flex 6126 points to determine operation. The ERV writes to values in I/O Flex 6126 to provide the user with its running status. If communication is lost the ERV will shut down and remain in the Off mode until communication is established. Refer to the troubleshooting section for details on communication failures. Table 2 shows the I/O Flex 6126 points that the ERV monitors for operation and a brief description of their functions. Table 3 shows the I/O Flex 6126 points that the ERV uses for its configurations and a brief description of each. Table 4 shows the I/O Flex 6126 points that the ERV writes to based on its running status.

Table 2 – Inputs - Points the ERV Read

Value	Expanded Text	Range	Units	Default	Function
NVO_MODE	nvoUnitStatus.mode	xxxx			Determine what mode RTU is in
OCCUPIED	Currently Occupied	No/Yes			Determine if RTU is occupied
IDFSTATE	Indoor Fan State	Off/On			Determine if the RTU indoor fan is running
FANSPEED	Commanded Fan Speed	xxx	%		Determine if the RTU indoor fan is running
IAQ	IAQ Level (sensor)	xxxx			Space CO2 sensor level (PPM)
IAQIN	IAQ Level (switch)	Low/High			Determine if CO2 is high or low
SAT	Supply Air Temperature	xxx.x	°F		RTU supply air temp
OA_TEMP	Outdoor Air Temperature	xxx.x	°F		RTU Outdoor Temp
SPACE_T	Space Temperature	xxx.x	°F		Building Space Air Temp
RETURN_T	Return Air Temperature	xxx.x	°F		Building Return Air Temp
PE_1	Power Exhaust 1 Relay	Off/On			N/A
PE_2	Power Exhaust 2 Relay	Off/On			N/A
IAQANCFG	IAQ Analog Input Config	0=No IAQ 1=DCV 2=Override IAQ 3=Ctrl Min Pos		0: no FIOP 1: FIOP	Tells if a sensor is installed for DCV or override
IAQANFAN	IAQ Analog Fan Config	0=Never 1=Occupied 2=Always		0	Tells if the ERV can run during unoccupied for high CO2
IAQINCFG	IAQ Switch Input Config	0=No IAQ 1=DCV N/O 2=DCV N/C 3=Override N/O 4=Override N/C		0	Tells if a switch is installed for DCV or override
IAQINFAN	IAQ Switch Fan Config	0=Never 1=Occupied 2=Always		0	Tells if the ERV can run during unoccupied for high CO2
DAQ_LOW	AQ Differential Low	0 to 5000		100	Sets indoor/outdoor PPM difference to start ventilating more
DAQ_HIGH	AQ Differential High	0 to 5000		700	Sets indoor/outdoor PPM at which max vent occurs
IAQOVPOS	IAQ Override Position	0 to 100	%	100	Sets OA fan speed during override
S_WHEEL	OAU Wheel Test	0 to100	%	0	Test wheel while in test mode
S_OAFAN	OAU OA Fan Speed Test	0 to100	%	0	Test intake fan(s) while in test mode
S_EXFAN	OAU PE Fan Speed Test	0 to100	%	0	Test exhaust fan(s) while in test mode
S_OAHEAT	OAU Tempering Heater Test	0 to 100	%	0	Test tempering heater while in test mode

Table 3 – Configurations - ERV Configurations Read

Value	Expanded Text	Range	Units	Default	Function
OAU_TYPE	Outdoor Air Unit Type	0=No OAU 1=ERV Module 2=Economizer* 3=Pwr Exhaust 4=OA Monitor 5=100% OA unit 6=EXv1 ERV		0: no FIOP 1: FIOP EXv2	Defines what kind of OAU is installed
OAFANCRV	Outside Air Fan Curve	0 to 999		1: 04 2: 05–06 3: 07 4: 08–12 5: 14 6: 17–20 7: 24–28	Determine what outside air fan curve to use
PEFANCRV	Exhaust Air Fan Curve	0 to 999		1: 04, 1ph, and econ* 2: 04, 3ph, and econ* 3: 04, 1ph, and no econ* 4: 04, 3ph, and no econ* 5: 05–06 1ph 6: 05–06 3ph 7: 07 8: 08–12 9: 14 10: 17–20 and econ* 11: 17–20 and no econ* 12: 24–28	Determine what exhaust air fan curve to use
UNOCCRUN	OAU Unoccupied Operation	No/Yes		NO	Tells OAU to run in unoccupied mode
FATALOAU	Shut Down on Fan Failure	No/Yes		YES	Tells OAU to shut off if one of it's fans fail
MODWHEEL	Modulating Wheel Install	No/Yes		NO	Determine if the OAU's wheel is a modulating one
MINOACFM	Minimum Outside Air CFM	0 to 32000	CFM	375: 04 800: 05–06 1000: 07 2500: 08–12 3000: 14 4000: 17–20 5000: 24–28	Sets Design OA CFM for ventilation
MINDCVSP	Min DCV Outside Air CFM	0 to 32000	CFM	100: 04 250: 05–06 600: 07 1000: 08–12 1500: 14–24 2000: 24–28	Sets absolute minimum OA CFM for ventilation
PEX_CTL	Power Exhaust Control	0=offset CFM 1=BP		0	Determine how to control the exhaust fans
EXOFFSET	Power Exhaust CFM Offset	–17000 to 17000	CFM	–200	Sets offset CFM setpoint of exhaust based on intake
OAU_BPSP	Building Pressure Setpnt	–0.25 to 0.25	inH_2O	0.05	Sets required building pressure
OATEMPER	Outside Air Tempering	Disable/Enable		Disable	Determine if there is tempering heater installed
OATMPLOC	OA Tempring Lockout Temp	0 to 80	°F	60	Sets the outside temp and below to allow tempering
OATMPSPT	OA Tempring SAT Setpoint	35 to 80	°F	55	Sets target Supply air temperature during tempering
OACFM_K	Outside Air CFM k Factor	0.8 to 1.2		1.0	Sets outside air curve correction factor
EXCFM_K	Exhaust Air CFM k Factor	0.8 to 1.2		1.0	Sets exhaust air curve correction factor
EFB_ENBL	ERV Fan Boost Enable	No/Yes		NO	Tells RTU to adjust fan speed for low outside air CFM

* Requires an Economize which is not available for Target EnergyX units at this time.

Table 4 – Status Points - ERV Writes these Values

Value	Expanded Text	Range	Units	Function
OAU_RUN	OAU System Run State	1=AUTO 2=OFF 3=TEST		High level ERV state
OAU_MODE	OAU Operating Mode	0=Off 1=ERV (DCV) 2=Free Cooling* 3=OA Tempering 4=Defrost 5=Test 6=Ext. Mode 1 7=Ext. Mode 2 8=Ext. Mode 3		ERV's current operating mode
OAU_VER	OA Unit Software Version	0 to 9999		Active EXCB software version
ACTOACFM	Actual Outside Air CFM	0 to 32000	CFM	Real Time CFM being brought in
ACTEXCFM	Actual Exhaust Air CFM	0 to 32000	CFM	Real Time CFM being exhausted
CMDOACFM	Command Outside Air CFM	0 to 32000	CFM	Commanded CFM to bring in
CMDEXCFM	Command Exhaust Air CFM	0 to 32000	CFM	Commanded CFM to exhaust
OAU_LAT	OAU Leaving Air Temp	xxx.x	°F	Air temperature leaving the ERV (RTU intake)
OAU_EXAT	OAU Exhaust Air Temp	xxx.x	°F	Air Temperature leaving the ERV (exhaust)
OAU_BP	Building Pressure	–0.25 to 0.25	inH_2O	Current building pressure
OAUWHEEL	OAU Wheel Speed	0 to100	%	Current ERV wheel speed
OAFANSPD	OAU OA Fan Speed	0 to100	%	Current ERV's intake fan speed
OAUPESPD	OAU Exhaust Fan Speed	0 to100	%	Current ERV's exhaust fan speed
OAHEATER	OAU Tempering Heater	0 to 100	%	ERV's SCR heater commanded capacity
OAUALRM1	OAU Motor Failure Alarm	Off/On		ERV's motor failure alarm status
OAUALRM3	OA Low CFM Alarm	Off/On		ERV's low CFM alarm status
OAUALRM4	OAU Alarm	Off/On		ERV's General Alarm status

* Requires an Economize which is not available for Target EnergyX units at this time.

20 and 25 Ton Modulating ERV

The modulating ERV is an intelligent ERV with variable speed fan motors. The ERV can provide a variety of volumes of outside air and offset it with different exhaust speeds. CO_2 sensors can also be tied into it for Demand control ventilation (DCV) operation. The modulating ERV will operate based on occupancy and the rooftop's operating mode, the following sections explain operation in detail. Refer to Fig. 4 for the overview flow diagram of a modulating ERV operation.

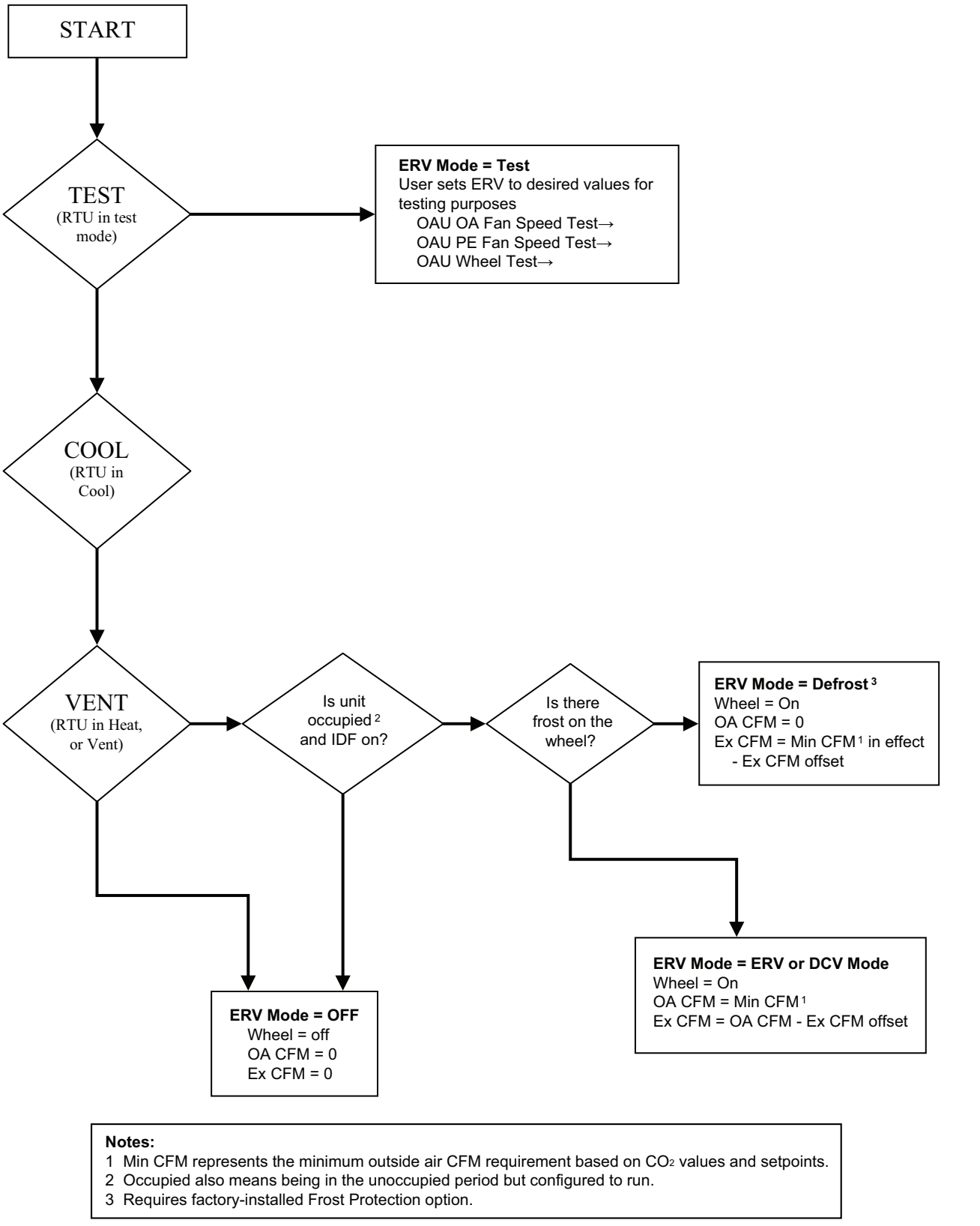
START
TEST
(RTU in test mode)
ERV Mode = Test
User sets ERV to desired values for testing purposes
OAU OA Fan Speed Test→
OAU PE Fan Speed Test→
OAU Wheel Test→
COOL
(RTU in Cool)
VENT
(RTU in Heat, or Vent)
Is unit occupied 2 and IDF on?
Is there frost on the wheel?
ERV Mode = Defrost 3
Wheel = On
OA CFM = 0
Ex CFM = Min CFM 1 in effect
- Ex CFM offset
ERV Mode = ERV or DCV Mode
Wheel = On
OA CFM = Min CFM 1
Ex CFM = OA CFM - Ex CFM offset
ERV Mode = OFF
Wheel = off
OA CFM = 0
Ex CFM = 0
Notes:
1 Min CFM represents the minimum outside air CFM requirement based on CO2 values and setpoints.
2 Occupied also means being in the unoccupied period but configured to run.
3 Requires factory-installed Frost Protection option.
C13025

Fig. 4 - Modulating ERV Control & Operation Flow Chart

Occupancy

The ERV will not be allowed to run unless it is determined to be occupied. The ERV monitors the rooftop's occupancy point to determine when it is occupied. The ERV watches the rooftop's indoor fan state point to know when its indoor fan has started. When the rooftop is occupied and its indoor fan is on, the ERV is considered to be occupied and allowed to run.

The ERV can also operate during the rooftop's unoccupied period. If the ERV is configured for unoccupied operation then it will ignore the building occupancy of I/O Flex 6126 and allow occupancy any time the rooftop fan is on.

Modes of Operation

The ERV has 3 basic functions: Auto, Off, or Test. These are defined as System run states and displayed in the OAU run status menu. The ERV will always operate in one of the following operating modes depending upon the mode and outside conditions: Off, ERV (DCV) Free Cooling, OA Tempering, Defrost, or Test. The ERV monitors to determine the rooftops operating mode. The values tell the ERV what the rooftop operating mode is in a numeric form. These modes are described below.

Off Mode —

The ERV will be set to the Off mode whenever the rooftop indoor fan is turned off, ERV is unoccupied or if communication fails. During Off Mode the wheel, outside air fan, and exhaust fan will be off.

Test Mode —

If at any time during operation, the rooftop is put in Service Test mode the ERV will be set to Test Mode. Refer to Start-Up section for Test mode operation.

Defrost Mode —

Defrost Mode is only available when the optional Frost Protection is factory installed in the ERV. The ERV will be set to defrost mode any time the ERV wheel is running and frost is detected on the wheel. Defrost Mode runs for at least 2 minutes but continues to run until the frost is removed. The frost protection device senses a pressure differential across the wheel and trips when that differential is greater than the setpoint (default 2.0 in wc). For information on the frost protection device, refer to the Major Component section.

When in Defrost Mode the outside air fan will ramp down to 0% speed (shut-off). The exhaust fan will run at a speed equal to the required offset CFM. Refer to Exhaust Control for details on determining offset CFM.

ERV (DCV) Mode —

General ERV Mode – ERV Mode is the basic operating mode of the ERV. With no options installed on the ERV this will be the only operating mode besides off and test. ERV Mode will be active when the rooftop mode is Heating, Cooling, Fan Only, or Dehumidification and the ERV is occupied.

DCV ERV Mode will be active when the rooftop mode is Heating, Cooling, Fan Only, or Dehumidification and the ERV is occupied.

When in DCV ERV mode the wheel will be rotating. The outside air fan will run at a speed that produces a CFM equal to the minimum outside air CFM determined by Demand Control Ventilation (DCV). The exhaust fan will run at a speed equal to the required offset CFM. Refer to Exhaust Control for details on determining offset CFM.

Switch Demand Control Ventilation (DCV) uses the indoor air quality levels (High/Low) to determine how much outside air is required for ventilation. The ERV monitors the IAQ switch reading from the rooftop's installed CO_2 switch. The minimum outside air CFM will be equal to one of the following: Min DCV outside air CFM setpoint, or the minimum outside air CFM setpoint. If the CO_2 switch reads low the outside air CFM requirement will be DCV.M. If the switch reads high the outside air CFM requirement will be OA.MN. The outside air fan will ramp its speed % up or down to produce the required CFM.

Exhaust Control

When the Power Exhaust control is set to Offset CFM the ERV exhaust fan operate to offset the outside air being introduced to the building. The required exhaust offset CFM is determined based on the exhaust offset setpoint. The exhaust offset setpoint can be set as a negative or positive number to accommodate a requirement of positive or negative building pressure. A positive setpoint will produce a negative building pressure. A negative setpoint will produce a positive building pressure.

The ERV will determine the required amount of outside air CFM based on setpoints and current mode of operation. The commanded exhaust air CFM is then calculated by the sum of the actual outside air CFM and the exhaust air offset setpoint. During defrost mode the exhaust will run the same as if the outside air fan were still running.

TROUBLESHOOTING

EnergyX units are a combination of the base rooftop unit and an integrated ERV. The ERV requires communication from the rooftop for operation. This section covers ERV troubleshooting only. For rooftop troubleshooting refer to the base unit's Service manual.

Complete ERV Stoppage

There are several conditions that can cause the ERV to shutdown or appear to be shutdown:

- General power failure.
- Transformer's circuit breaker tripped.
- ERV main power fuses blown.
- Communication failures.
- Active alarm on the base rooftop unit or the ERV preventing operation. Review alarms.

- Programmed occupancy schedule. Rooftop Unoccupied
- Rooftop indoor fan is off.
- The airflow sensor tubing connected to the incorrect high/low sensor ports in the outside air.

Wheel Status (Option) —

NOTE: Wheel Status requires installation of the optional wheel motion sensor.

This alarm will occur when the ERV wheel is turned on and the wheel proxy sensor does not detect wheel motion within the set time. It will open its contact which energizes the normally closed rotation monitor relay. This alarm will automatically reset when motion is detected. Possible causes of this alarm are: the wheel belt breaking or slipping, wheel motor failure, proxy sensor failure or incorrect setting, or wiring error.

On-board Pressure Transducers

The EXCB uses on-board pressure transducers to measure the air pressure of the incoming outside air and the building exhaust air. The CFM values are then calculated based on these readings and the fan speed. There is a pressure transducer for the outside air and one for the exhaust air. These are screwed into the EXCB board to J24 and J25 respectively. They have three pins: IN, GND, and OUT. The IN pin is 5vdc input power and GND is the common or ground pin. The OUT pin will be 0.26 to 4.5vdc based on the pressure reading. There are two different transducers used, two inch of water column (inWC) and 5 inWC. Table 5 shows the voltage/pressure characteristics of each.

Table 5 – Transducer/Voltage vs. Pressure

Voltage (vDC)	Pressure (inWC)	
	2" transducer	5" transducer
<=0.26	0	0
0.5	0.12	0.28
1	0.34	0.87
1.5	0.53	1.46
2	0.82	2.05
2.5	1.06	2.64
3	1.30	3.23
3.5	1.52	3.82
4	1.76	4.41
4.5	2.00	5.00

EnergyX Control Board LEDs

The EnergyX Control Board (EXCB) has five green LEDs and one red LED. The red LED is for power indication and the green LEDs are status indicators (see Table 6 for details).

MAJOR SYSTEM COMPONENTS

An EnergyX unit has a factory installed energy recovery (ERV) device on a 48/50HC rooftop unit. The EnergyX energy recovery unit is integrated into the base rooftop unit construction and is factory wired. The energy recovery unit contains a control box, supply fan, exhaust fan, and an enthalpy wheel assembly. All control operations of the ERV are based on the rooftop units operation through communication with I/O Flex 6126. See Fig. 5 and 6 for ERV wiring schematic and component arrangement.

Table 6 – EXCB LED Indicators

LED	COLOR	DESCRIPTION	STATUS IF LIGHT IS LIT
D9	Red	24vAC board power	Board has power
D2	Green	Run light Flashing	ERV is Running
D12	Green	ERV Wheel Status Alarm [1]	ERV Wheel not rotating when it should be
D14	Green	ERV Wheel Frost Protection [2]	ERV detects frost on the wheel and running in Frost Mode
D16	Green	ERV Dirty Filter Alarm [3]	Dirty Filter
D18	Green	ERV Blower Status Alarm	Fan Failure

1 Requires installation of optional Wheel Motion sensor
2 Requires installation of optional Frost sensor
3 Requires installation of optional Filter sensor

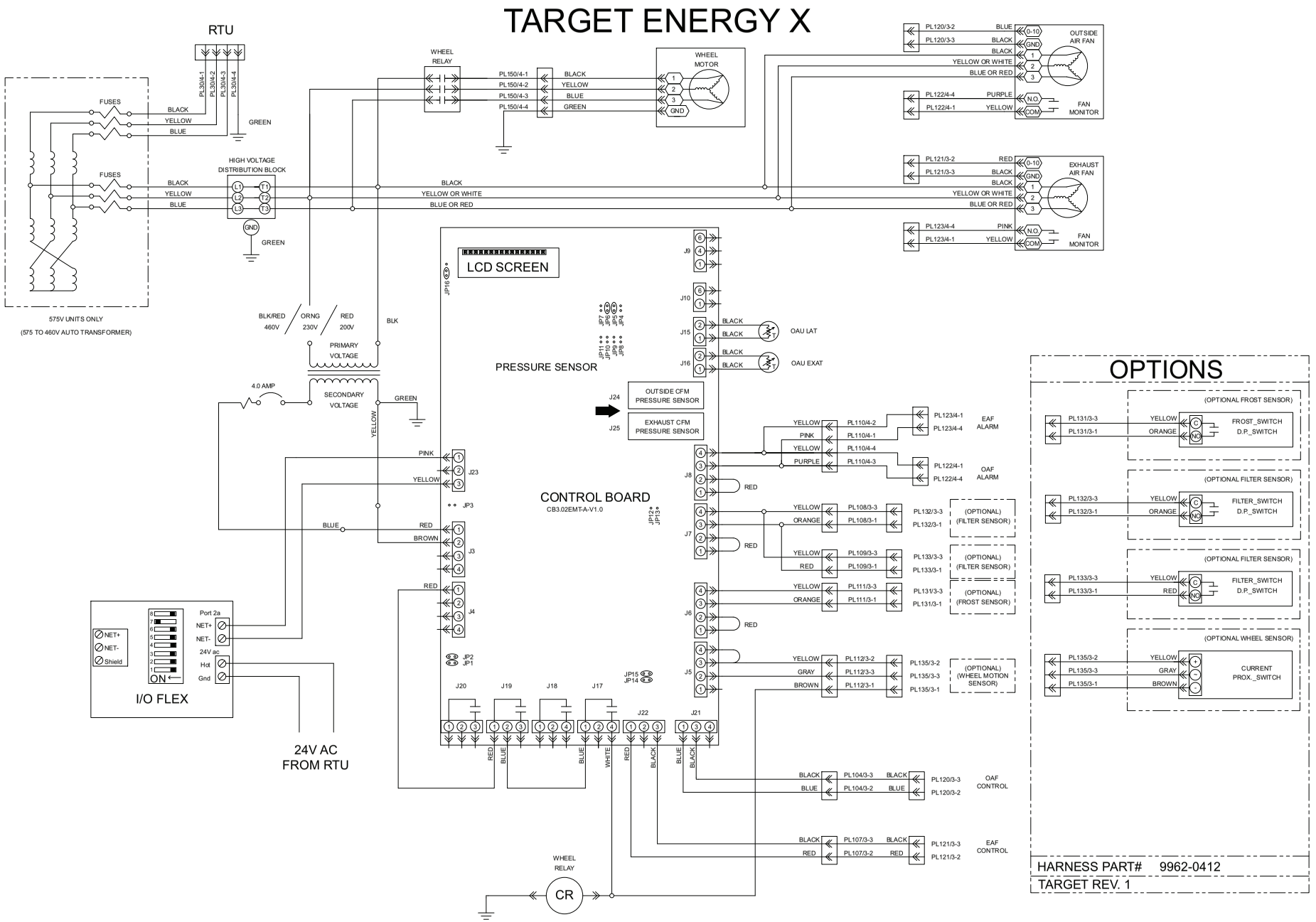

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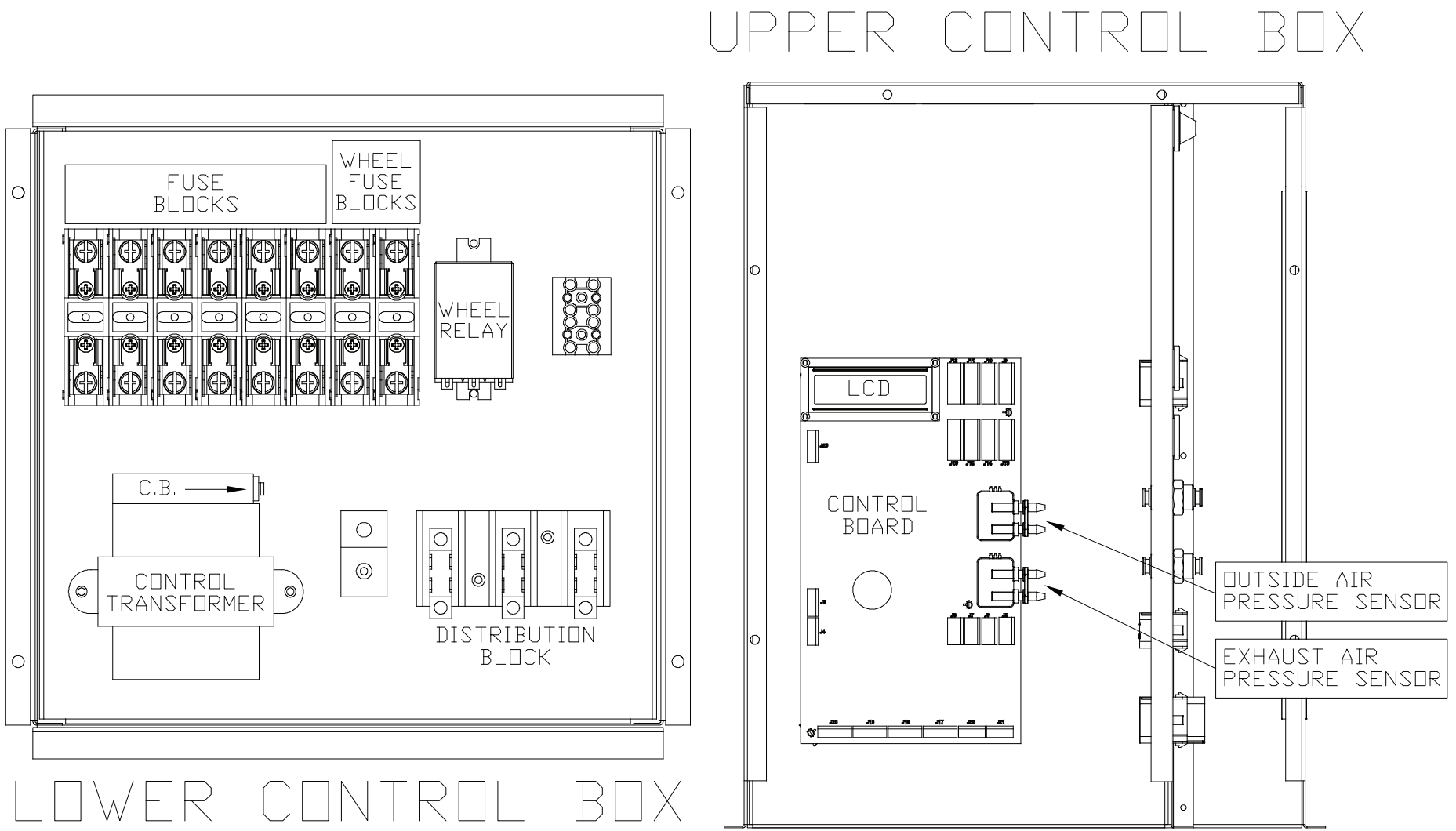
Fig. 5 - Modulating ERV Wiring Schematic



AIR FLOW TUBING	
GREEN	OUTSIDE AIR HIGH
YELLOW	OUTSIDE AIR LOW
RED	EXHAUST AIR HIGH
CLEAR	EXHAUST AIR LOW

C12776

Fig. 6 - EnergyX Component Layout

EnergyX Control Board (EXCB)

See Fig. 7 and Table 7.

The EXCB board is the muscle of the ERV control system. The EXCB continuously monitors input/output channel information received from its inputs. The EXCB receives inputs from transducers and discrete inputs. See Options and Accessories section. The EXCB has relay analog outputs, and is equipped with a LCD screen. The EXCB has a reset button that is used to force all the outputs and reset communication.

NOTE: There are hardware jumpers set throughout the board. Do not change these jumpers.

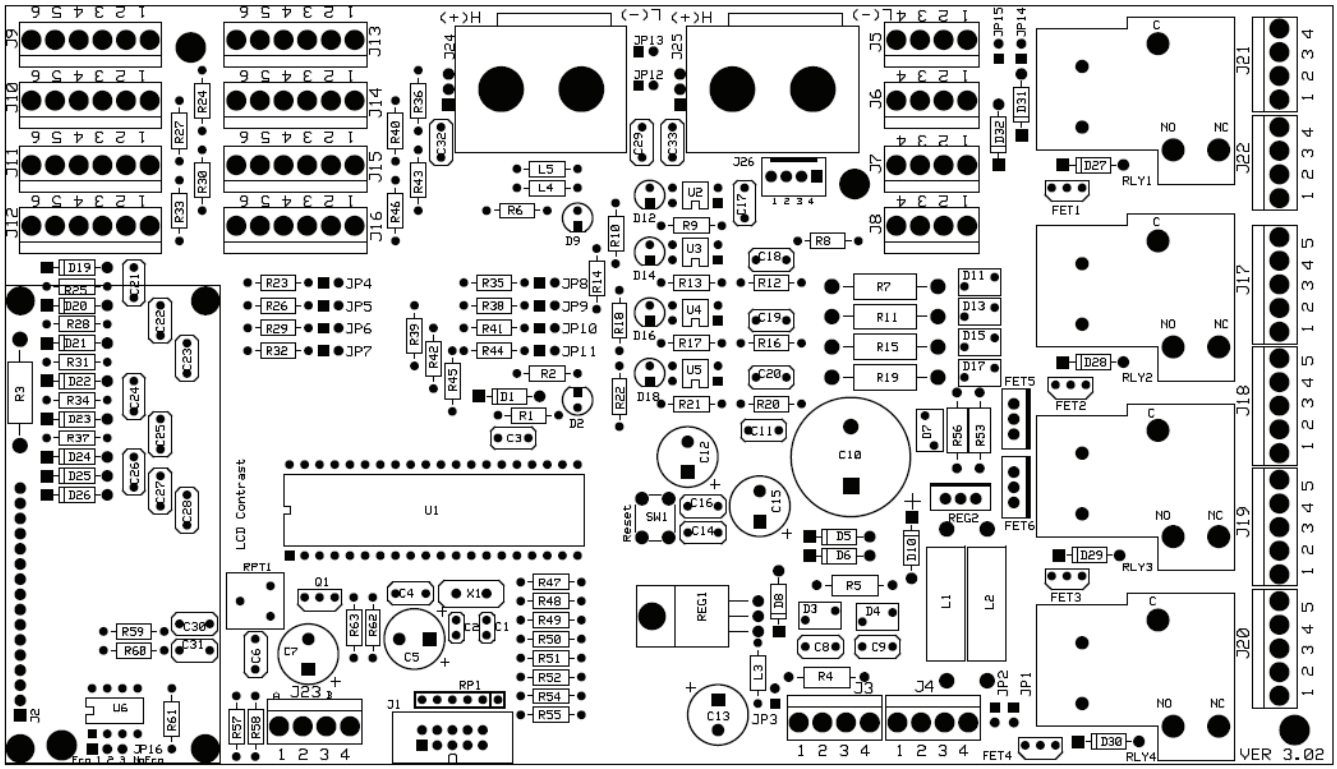


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Fig. 7 - EnergyX Control Board (EXCB)

Table 7 – EXCB Input/Output Connections

POINT DESCRIPTION	SENSOR LOCATION	Input/Output	TYPE OF Input/Output	CONNECTION PIN NUMBER
Download	N/A	Both	Communication	J1
Power from TRANS	Control box	Input	24VAC	J3, 1–2
Power to Relays	Low voltage control box	Output	24VAC	J4, 1
Wheel Rotation Sensor	Attached to scoop	Input	Switch	J5, 2–4
Frost Switch	Attached to scoop	Input	Switch	J6, 3–4
Leaving Air Temp	Scoop section	Input	10K	J15, 1–2
Exhaust Air Temp	Exhaust air section	Input	10K	J16, 1–2
Wheel Relay	High voltage control box	Output	Relay	J17, 4
OA fan speed signal	N/A	Output	2–10vdc	J21, 1–3
EX fan speed signal	N/A	Output	2–10dvc	J22, 1–3
Outside Air pressure Transducer	Low voltage control box	Input	Digital 0–5vdc	J24
Exhaust Air pressure Transducer	Low voltage control box	Input	Digital 0–5vdc	J25
Building Pressure Sensor	Low voltage control box	Input	4–20mA	J10, 1–6

Enthalpy Wheel

The enthalpy wheel is the “heat exchangers” of the ERV. It consists of several wheel segments aligned in a cassette assembly. These are not “filters” but made of a desiccant material. The wheel is rotated by a motor and belt, no adjustments required. When the wheel rotates it uses the building exhaust air to pre-conditions the outside air as it passes through the wheel.

Modulating Fan

The modulating ERV is equipped with direct drive variable speed plenum fans for outside air intake and exhaust air. The motors have built in VFDs that accept a 2-10vdc signal from the EXCB. This 2-10vdc signal is used by the VFD to determine the speed to run the motor at (0-100%).

Each motor is capable of diagnosing problems within the motor to provide fan status. The fan status switches are built into each motor and provide a feedback to the EXCB if a problem is detected. The feedback signal is a discrete input that is normally open, when closed the EXCB will initiate the motor status alarm.

Options and Accessories

The modulating ERV has several optional factory installed options and field installed accessories: Frost Protection, Wheel Motor Status, Filter Maintenance, horizontal adaptor curb, building pressure sensor, and Outside Air Tempering Kit. Refer to Table 7 for where these options wire into the EXCB.

Frost Protection (factory-installed option only)

Frost protection is a factory installed pressure sensor device which senses a differential pressure across the wheel. This occurs if frost builds up on the wheel. The sensor closes its contact when the pressure differential is greater than the setpoint. When the EXCB reads the contact closer it will activate defrost mode. The setpoint is a dial on the sensor, is adjustable from 0.2 to 2.0 inWC, and is factory preset to 2.0 inWC. Changing this setting may cause false signal causing defrost mode when not needed.

Wheel Motor Status (option)

The wheel motor status accessory can be installed in the field and consists of a wheel motion proxy sensor and a relay. The wheel motion sensor is aimed at the wheel to detect rotation. If the wheel does not rotate at the appropriate speed the sensor will open causing the rotation monitor relay to close a contact to initiate the wheel status alarm. The motion sensor is factory set at the highest speed (clockwise until stop) and should not be changed. Refer to the troubleshooting section for details on the alarms.

SERVICE & MAINTENANCE

Refer to base unit's Service manual for base unit service and maintenance. This section contains service and maintenance for just the ERV unit.

Cleaning

Wheel and Segment Cleaning

Wheel cleaning periodicity is application dependent. Field experience shows that offices, schools and other "clean" environments will often go 10 years before any build up of dust and dirt is noticed. Other applications such as restaurants, casinos and factory environments may experience fairly rapid build-up of contaminants and may require multiple cleanings per year to maintain airflow and recovery efficiencies.

All air-to-air energy recovery devices will become dirty over time, even with well-maintained filtration. Proper filtration usage and changes will improve the life of the wheel transfer segments. Once the wheel is exposed to oils, tars or greases in either the supply or exhaust air streams, these pollutants deposit on the rotary surface which they become "sticky" and begin to attract and hold the dust particles that previously passed thru the wheel. Over time this particle build up can lead to blocked airflow passages, loss of recovery, excessive pressure drop through the wheel and loss of energy savings.

1. Follow steps for wheel and segment removal to remove the affected energy transfer matrix segments.
2. Gently brush the wheel face to remove loose accumulated dirt.
3. Wash the segments with a non-acid based (evaporator) coil cleaner or alkaline detergent solution. Non-acid based coil cleaner such as KMP Acti-Clean AK-1 concentrate in a 5% solution has been demonstrated to provide excellent results. **DO NOT** use acid based cleaners, aromatic solvents, temperatures in excess of 170°F or steam! Damage to the wheel will result.
4. Soak the wheel and/or segments in the cleaning solution until all grease and tar deposits are loosened. An overnight soak may be required to adequately loosen heavy deposits of tar and oil based contaminants.
5. Internal heat exchange surfaces may be examined by separating the polymer strips by hand. (Note: some staining of the desiccant may remain and is not harmful to performance.)
6. After soaking, rinse the dirty solution from the wheel segments until the water runs clear.
7. Allow excess water to drain prior to replacing segments in the wheel. A small amount of water remaining in the wheel will be dried out by the airflow.

Filters

Clean or replace at start of each heating and cooling seasons, or more often if operating conditions require (based on filter manufacture recommendation or filter status alarm indication). Refer to Table 1 for type and size of filters.

Outdoor-Air Inlet Screens

Clean screens with steam or hot water and a mild detergent at the beginning of each heating and cooling season. Do not use throwaway filters in place of screens.

Lubrication

All component bearings are sealed and do not require lubrication.

Wheel Drive Adjustment

The wheel motor and drives do not require adjustment. The wheel drive pulley is secured to the drive motor shaft by a set screw. The set screw is secured with removable locktite to prevent loosening. Annually confirm set screw is secure. The wheel drive belt is a urethane stretch belt designed to provide constant tension throughout the life of the belt. Inspect the drive belt annually for proper tracking and tension. A properly tensioned belt will turn the wheel immediately after power is applied with no visible slippage during start-up.

Wheel Air Seal Adjustment

Diameter seals are provided on each wheel cassette to minimize transfer of air between the counter flowing airstreams. Follow below instructions if adjustment is needed.

1. Loosen diameter seal adjusting screws and back seals away from the wheel surface. See Fig. 8.

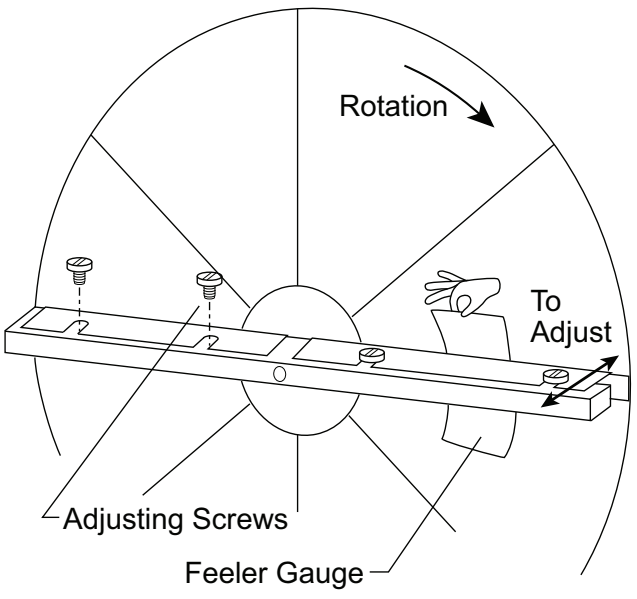

Fig. 8 - Diameter Seal Adjustment

2. Rotate the wheel clockwise until two opposing spokes are hidden behind the bearing support beam.
3. Using a folded piece of paper as a feeder gauge, position the paper between the seal and wheel surface.
4. Adjust the seal towards wheel surface until a slight friction on the feeder gauge (paper) is detected while moving the gauge along the length of the spoke.
5. Re-tighten adjustment screws and re-check clearance with the feeder gauge.

Wheel and Segment Removal / Installation

The wheel and segments represent a substantial portion of the value of the cassette therefore must be handled with care and never be dropped. Use a suitable crate or harness to lift wheel and segments to a roof surface, never use the shipping cartons for this purpose. Wheel and segments may require "slight" persuasion during installation and removal but never forced or impacted with a hammer or similar tool. The wheel assembly can be removed and installed or the wheel or segments can be removed from the assembly.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage.

The weight of the wheel assembly must be supported when the assembly is extended from the unit chassis to avoid damage to wheel or unit.

ERV wheels on 20 and 25 ton units are segmented wheel assemblies. To remove or installed the whole assembly, simply side in or out the assembly noting the motor power plug.

Wheel Segment Removal / Installation

1. Turn off, lockout and tag-out electrical power to unit.
2. Open access door to the EnergyX module on back side of the unit.
3. Slide the entire wheel assembly out until the necessary segment(s) of the wheel can be accessed. Support the weight of the wheel assembly as necessary to avoid damage to wheel or unit.

⚠ CAUTION

PERSONAL INJURY HAZARD

Failure to follow this caution may result in personal injury.

Weight of the installed segment will cause the wheel to accelerate in rotation as segments are removed. Failure to maintain control of the wheel rotation while installing all segments could cause severe injury to fingers or hand caught between revolving spokes and the bearing support beam. The handle of a tool such as a hammer, should be inserted through spokes and above or below bearing support beams to limit rotation of unbalanced wheel. See Fig. 9.

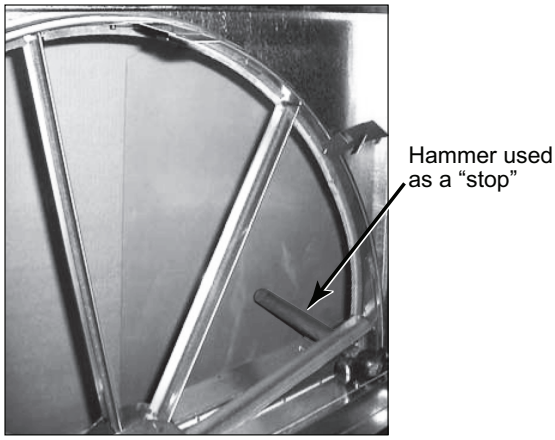

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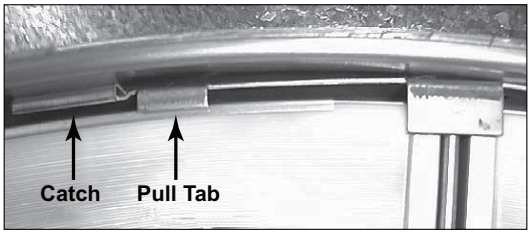
Fig. 9 - Wheel Stop

4. Position one segment opening at the top of the cassette.
5. Unlock and open the segment retaining brackets on both sides of the selected segment opening. See Fig. 10.



C11471

Fig. 10 - Segment Retaining Brackets

6. Gently lift segment outward.
7. Close segment retaining latches and rotate wheel 180° to remove next segment. Follow this pattern to remove all segments and keep wheel balanced.
8. To install the wheel segments, hold the segment as vertically as possible and centered between spokes, insert nose of segment downward between the hub plates. See Fig. 11.

C11472

Fig. 11 - Segment Removal

NOTE: The face of the segment, with the imbedded stiffener (vertical support between nose and rim end of segment) must face the motor side of the cassette. See Fig. 12.

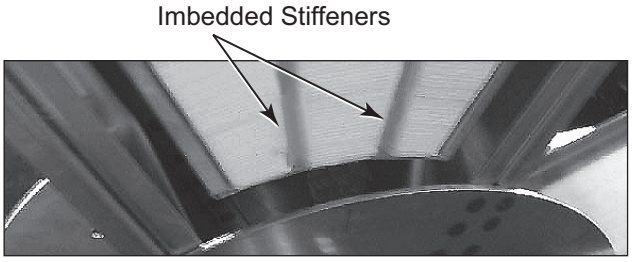


Fig. 12 - Imbedded Wheel Stiffeners
(shown from motor side of wheel assembly)

9. Ease the segment downward until its outer rim clears the inside of the wheel rim. Press the segment inward against the spoke flanges.
10. Close and latch segment retaining brackets to the position shown in Fig. 10 Make certain the retaining bracket is fully engaged under the catch.
11. Slowly rotate, by hand, the first installed segment to the bottom of the cassette, and then install the second segment opposite the first. Repeat this sequence with the two installed segments rotated to the horizontal position to balance the weight of installed segments.
12. Continue this sequence with the remaining segments as necessary.
13. When complete, close access door and remove lockout and tag-out to apply power to unit.

Whole Wheel Removal/Installation (36" wheels)

These wheels include the shaft and are secured to two wheel support beams by two flange bearings with locking collars.

Follow the steps below for removal and reverse for installation. See Fig. 13.

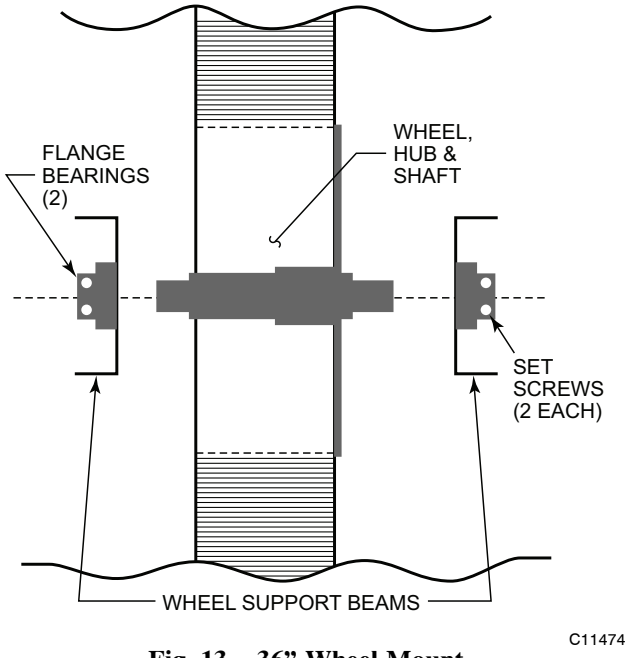


Fig. 13 - 36" Wheel Mount

1. Loosen the two set screws on each to the two wheel bearings.
2. Remove belt from pulley and position temporarily around wheel rim.
3. Remove pulley side wheel support beam with bearing, by removing four support beam screws.
4. Pull the wheel with the shaft straight out of the motor side wheel support beam and bearing. Handle wheel with care.
5. When replacing wheel be certain to tighten four bearing set screws. Premature bearing failure can occur if not set tightly.

Outside Air and Exhaust Air Hood Removal

Outside Air Hood Removal

1. Turn off, lockout and tag-out electrical power to unit.
2. Remove the hood by removing the seal-tek screws along the perimeter of the hood. See Fig. 14.

NOTE: Even after all screws have been removed from entire perimeter of hood, it will still be difficult to remove due to the gasket applied from original installation. Take care not to damage the gasket. If damage occurs use 9430-2300 gasket to replace before reattaching the hood.

3. Disconnect the green (HIGH) and yellow (LOW) tubes attached to the quick connects located inside the ERV. Do NOT damage the tubes.

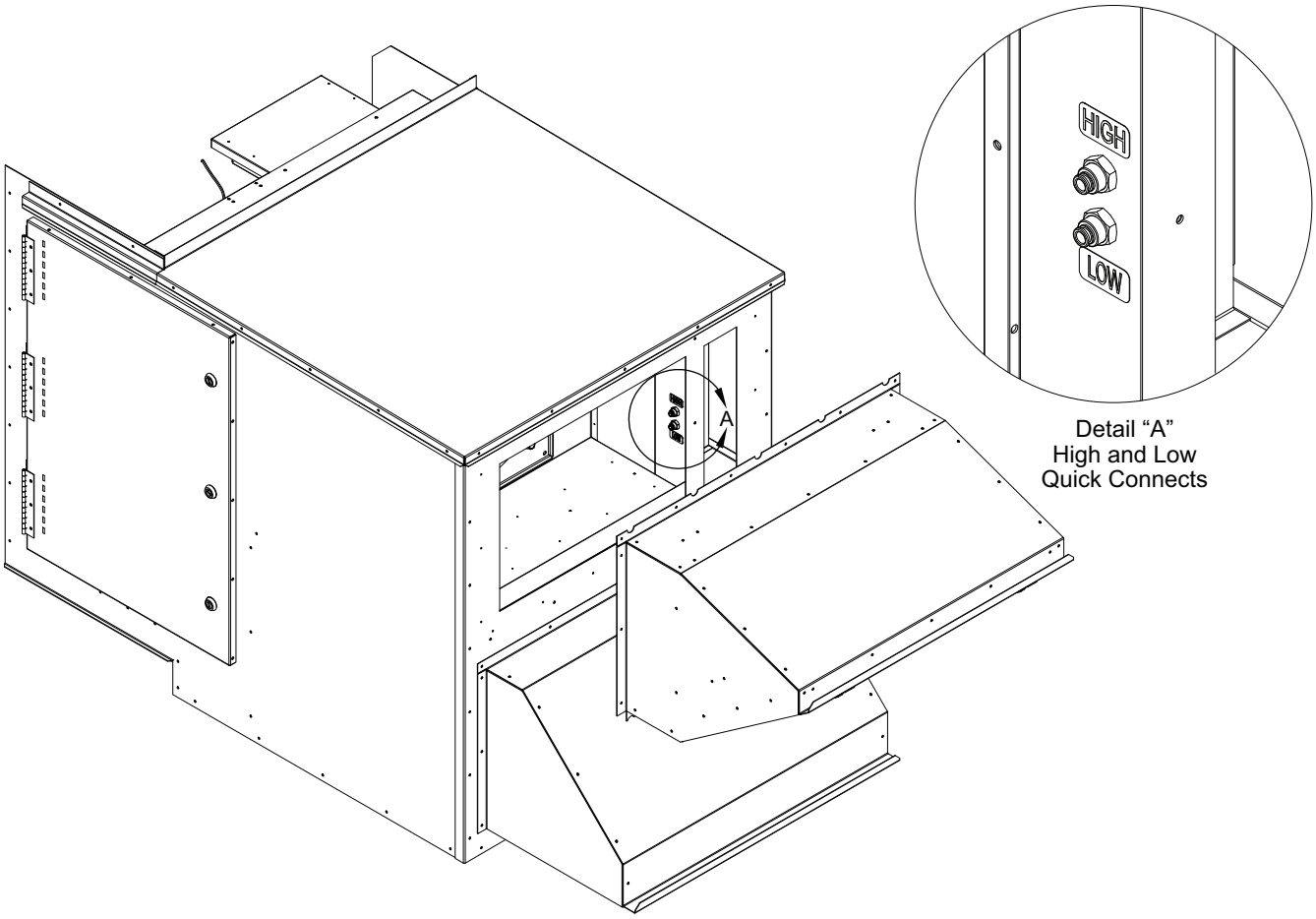


Fig. 14 - Outside Air Hood Removal

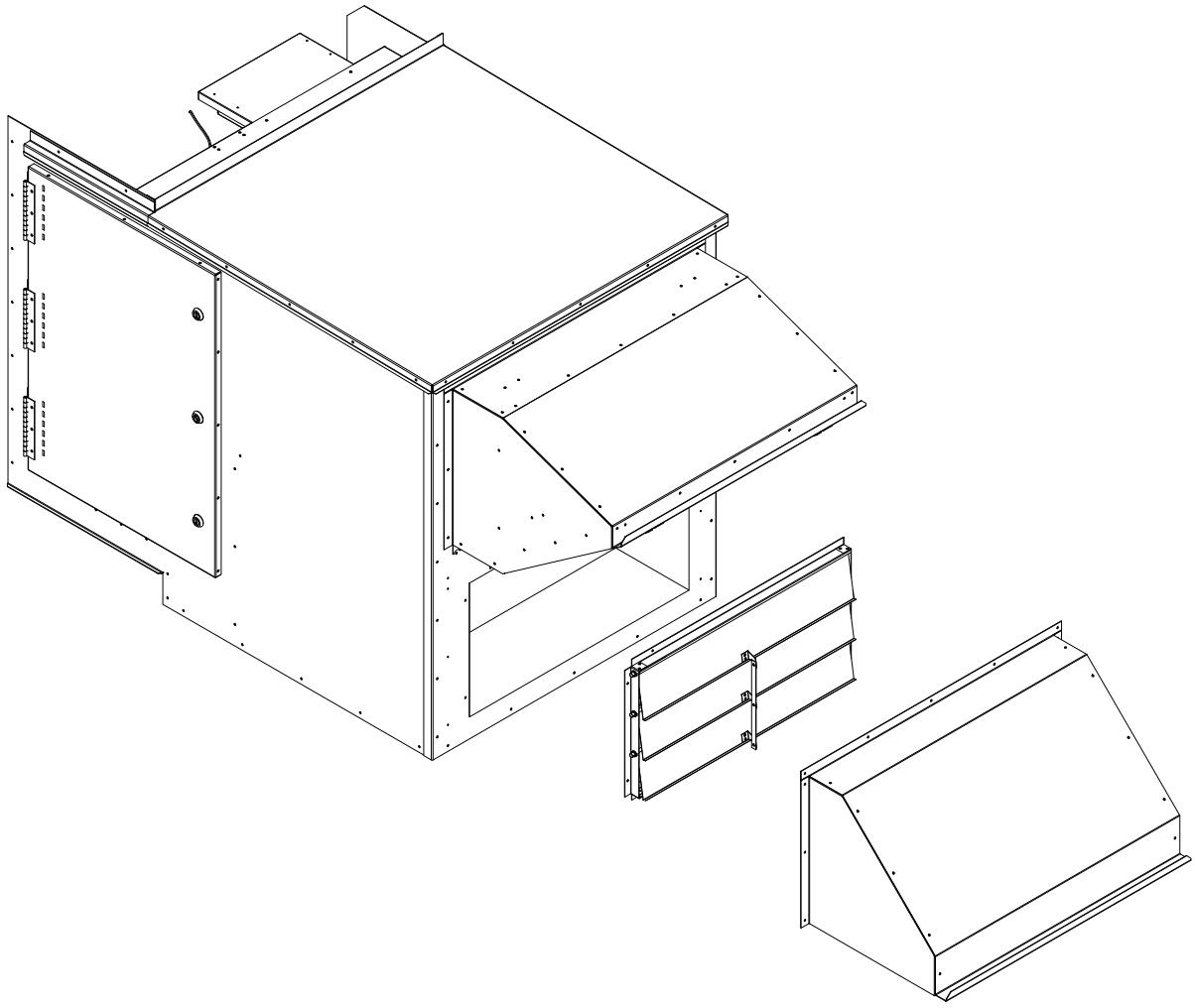


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Fig. 15 - Exhaust Air Hood Removal

Exhaust Air Hood Removal

1. Turn off, lockout and tag-out electrical power to unit.
2. Remove the hood by removing the seal-tek screws along the perimeter of the hood. See Fig. 15.

NOTE: Even after all screws have been removed from entire perimeter of hood, it will still be difficult to remove due to the gasket applied from original installation. Take care not to damage the gasket. If damage occurs use 9430-2300 gasket to replace before reattaching the hood.

Outside Air and Exhaust Fan Replacement

Outside Air Fan Removal

1. Turn off, lockout and tag-out electrical power to unit.
2. Remove outside air hood (see procedure on page 22).
3. Disconnect the connector PL121, PL123 and the power wires for the outside air fan motor from the wiring harness inside the air chamber of the EnergyX.
4. Remove the fasteners at each corner of the outside air fan that secure the outside air fan front panel to the dividing wall by access through the hood opening of the ERV. See Fig. 16.

NOTE: See instructions for removing the wheel and supply filters if more room is needed to access the outside air fan through the door for better maneuverability.

5. Remove the four bolts holding the front fan panel onto the rest of the outside air fan assembly. Completely remove this panel from the ERV.

NOTE: Tilt the fan assembly front panel to fit it through the hood opening.

6. Pull the outside air fan out through the hood opening. See Fig. 17.

NOTE: Tilt the fan assembly to fit its back panel through the opening in the dividing wall.

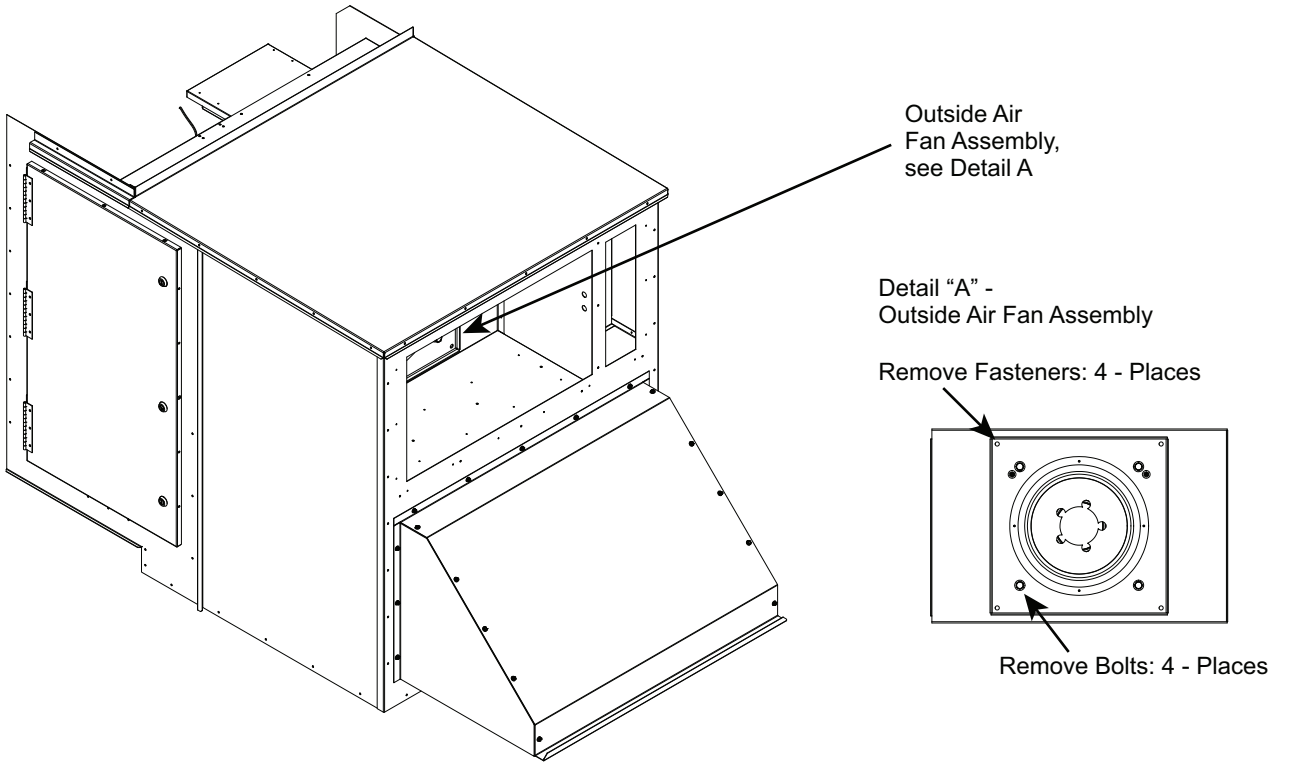


Fig. 16 - Remove Fasteners from Corners of Outside Air Fan Assembly

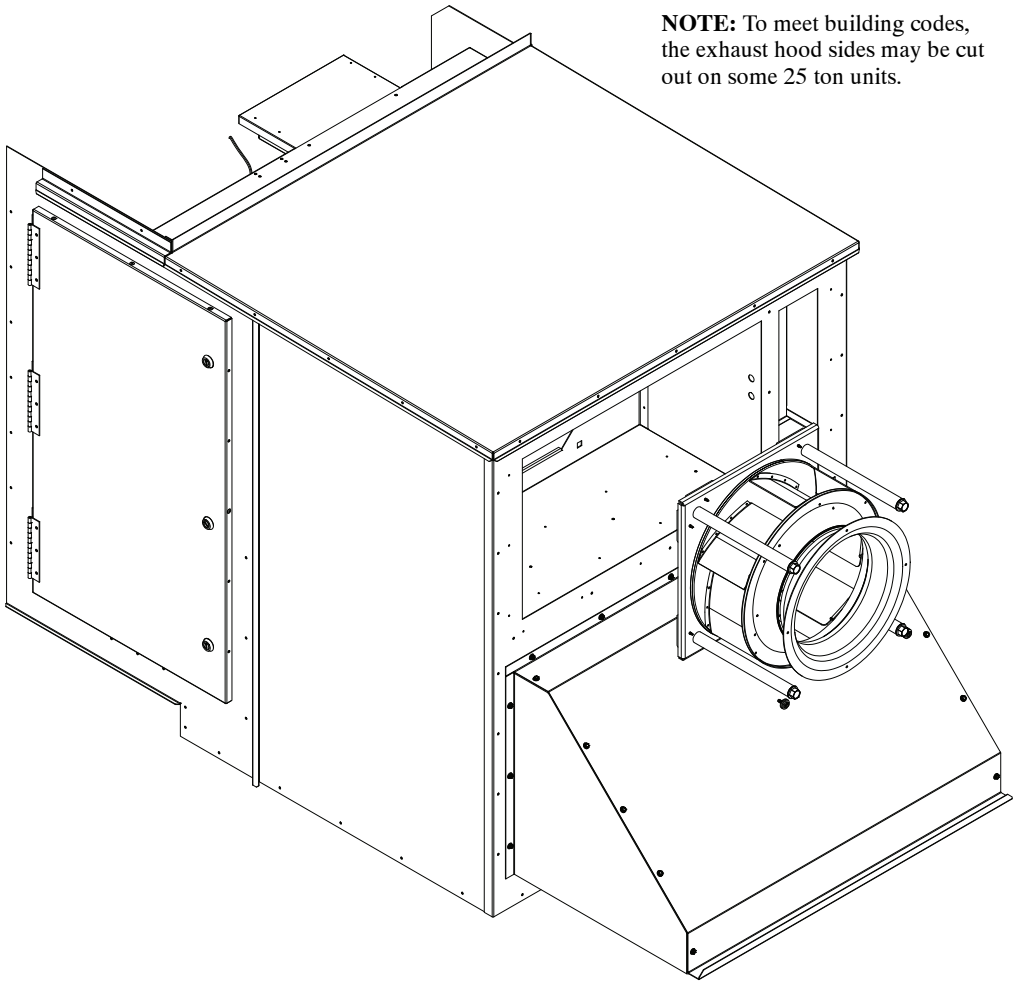


Fig. 17 - Outside Air Fan Removal

Exhaust Fan Removal

1. Turn off, lockout and tag-out electrical power to unit.
2. Remove the exhaust air hood (see procedure on page 23).
3. Open the door to the EnergyX unit in order to gain access to the exhaust fan front panel.

NOTE: See instructions for removing the wheel and exhaust filters if more room is needed to access the exhaust fan front panel.

4. Remove the fasteners around the perimeter of the exhaust fan that secure the exhaust fan front panel to the dividing wall by access through the door of the unit. See Fig. 18.
5. Disconnect connectors PL120 and PL122 as well as the power wires for the exhaust fan motor from the wiring harness inside the air chamber of the EnergyX unit.

NOTE: Tilt the fan assembly front panel to fit it through the hood opening.

6. Pull the exhaust air fan out through the hood opening. See Fig. 18.

NOTE: Tilt the fan assembly to fit its back panel through the opening in the dividing wall.

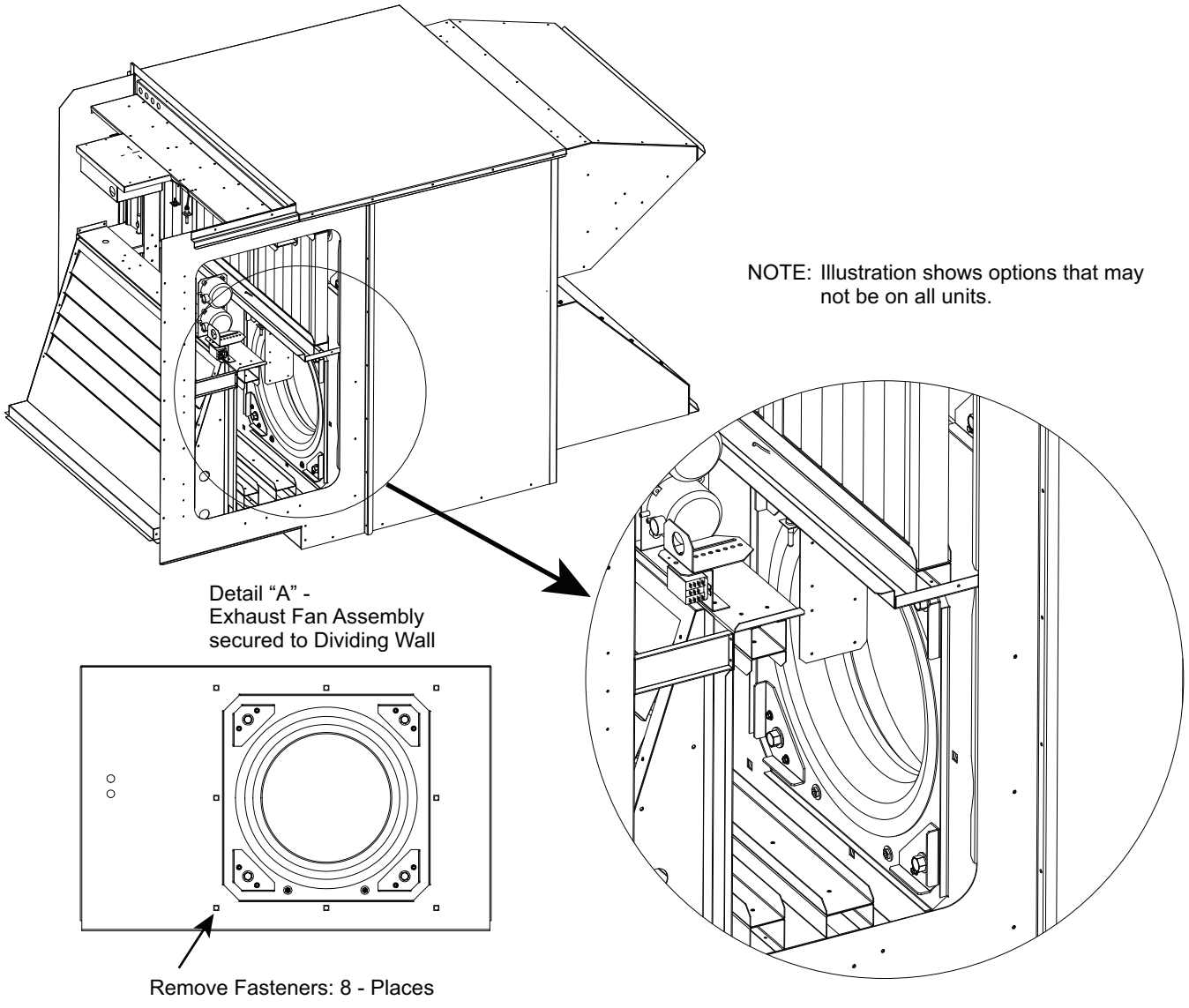

NOTE: Illustration shows options that may not be on all units.
Detail "A" -
Exhaust Fan Assembly
secured to Dividing Wall
Remove Fasteners: 8 - Places
C13030

Fig. 18 - Exhaust Fan Assembly - Fastener Locations

NOTE: To meet building codes, the exhaust hood sides may be cut out on some 25 ton units.

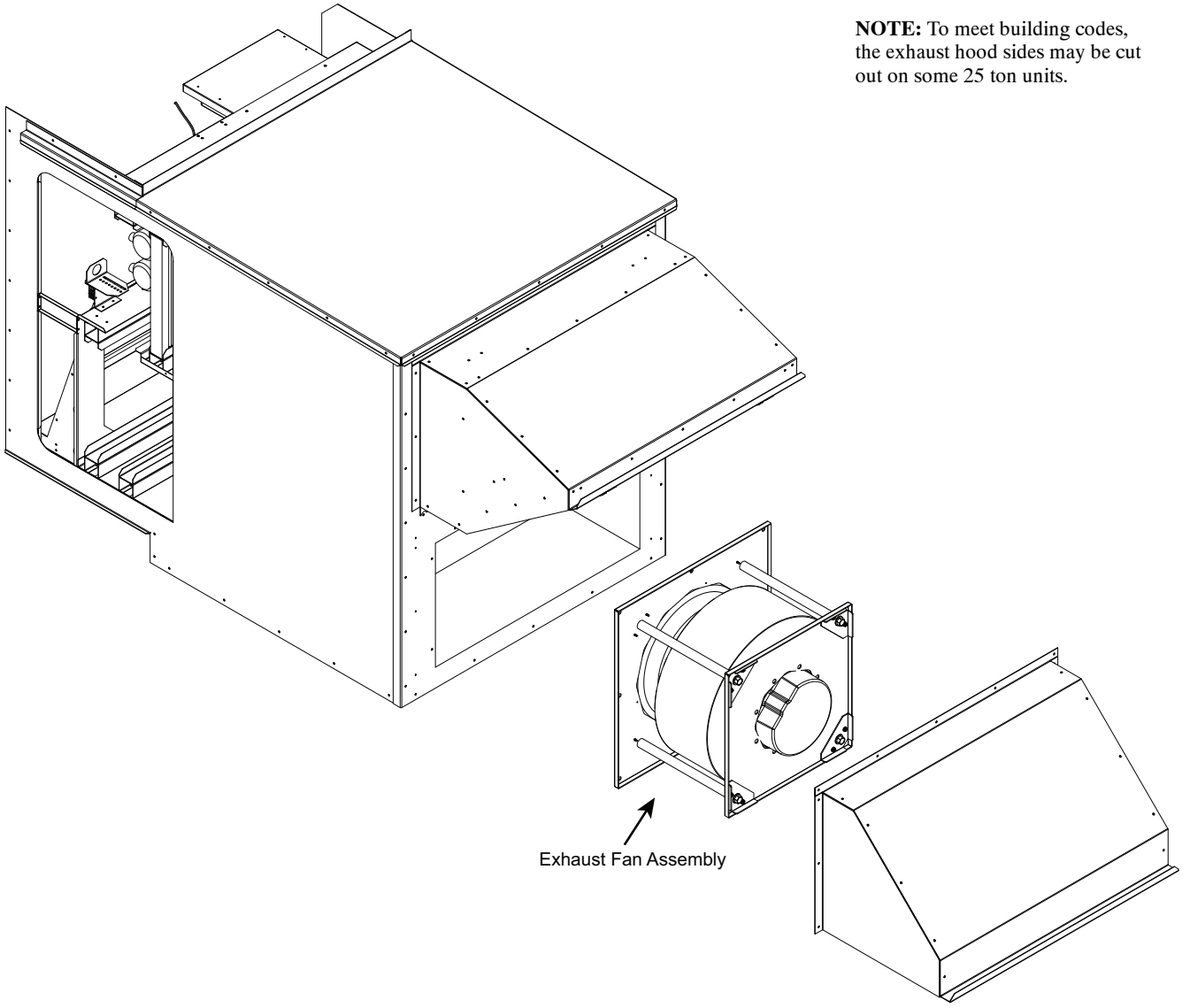


Fig. 19 - Exhaust Fan Assembly - Removal

APPENDIX

Appendix A — Certified Dimension Drawings

Appendix B — Exhaust Fan Performance Curves

EnergyX Modulating Volume 20 and 25 Ton Units

Appendix C — Electrical Data:

Table 8 - 48HC with ERV: Unit Wire/Fuse or HACR Breaker Sizing Data

Table 9 - 48HC with ERV and Factory-Installed HACR Breaker

Table 10 - 48HC with ERV and 2-Speed Indoor Fan Option

Table 11 - 48HC with ERV, Factory-Installed HACR Breaker and 2-Speed Indoor Fan Option

Table 12 - 50HC with Electric Heat and ERV: Unit Wire/Fuse or HACR Breaker Sizing Data

Table 13 - 50HC with Electric Heat, ERV and Factory-Installed HACR Breaker

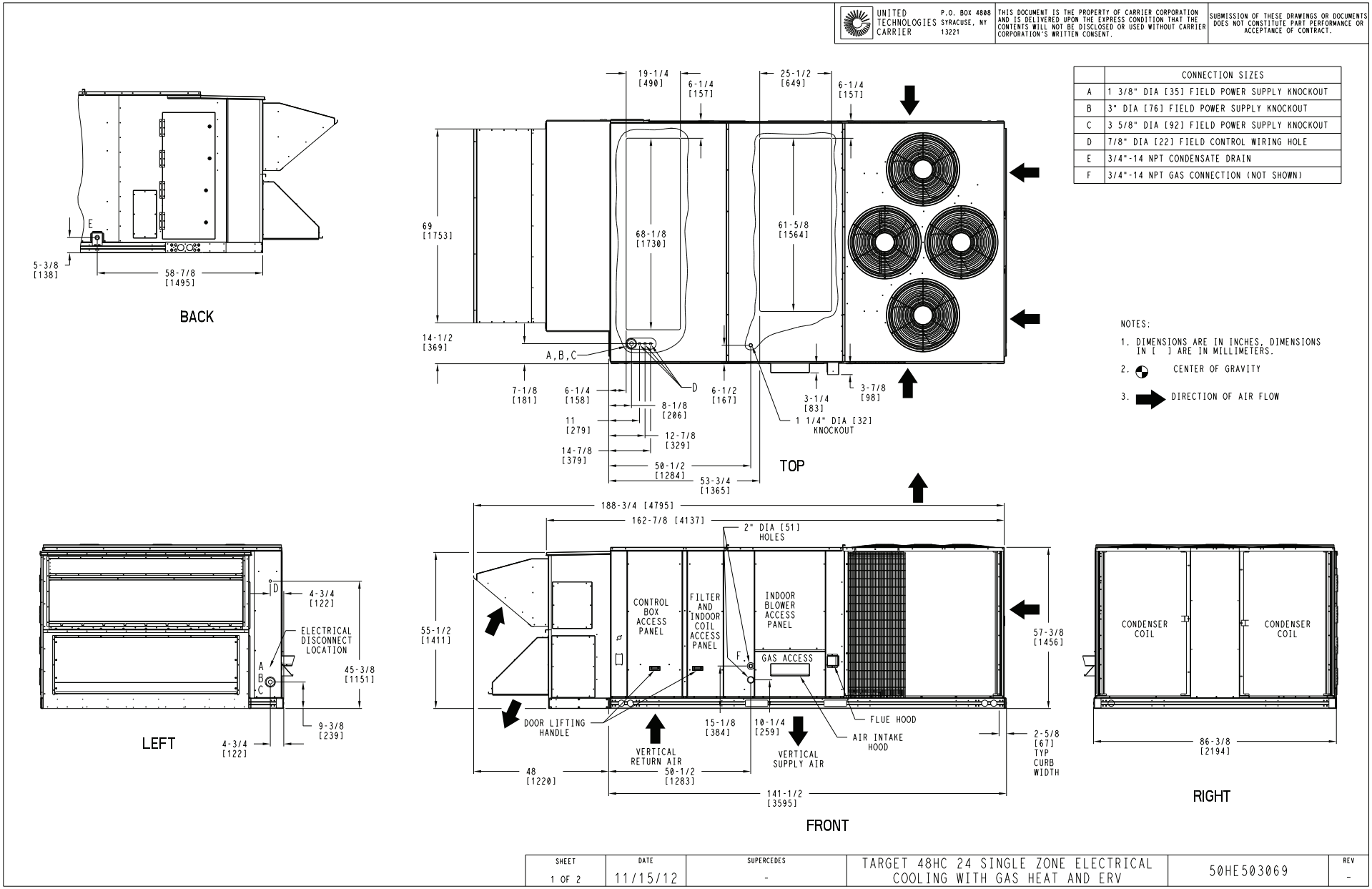
Table 14 - 50HC with Electric Heat, ERV and 2-Speed Indoor Fan Option

Table 15 - 50HC with Electric Heat, ERV, Factory-Installed HACR Breaker and 2-Speed Indoor Fan Option

Appendix D — I/O Flex 6126 Installation Guide

Appendix E — Carrier BACview/Virtual BACview Commissioning

APPENDIX A — CERTIFIED DIMENSION DRAWINGS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CONNECTION SIZES
A 1 3/8" DIA [35] FIELD POWER SUPPLY KNOCKOUT
B 3" DIA [76] FIELD POWER SUPPLY KNOCKOUT
C 3 5/8" DIA [92] FIELD POWER SUPPLY KNOCKOUT
D 7/8" DIA [22] FIELD CONTROL WIRING HOLE
E 3/4"-14 NPT CONDENSATE DRAIN
F 3/4"-14 NPT GAS CONNECTION (NOT SHOWN)
NOTES:
1. DIMENSIONS ARE IN INCHES, DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. CENTER OF GRAVITY
3. DIRECTION OF AIR FLOW
BACK
TOP
LEFT
FRONT
RIGHT
CONTROL BOX ACCESS PANEL
FILTER AND INDOOR COIL ACCESS PANEL
INDOOR BLOWER ACCESS PANEL
GAS ACCESS
ELECTRICAL DISCONNECT LOCATION
DOOR LIFTING HANDLE
VERTICAL RETURN AIR
VERTICAL SUPPLY AIR
FLUE HOOD
AIR INTAKE HOOD
2" DIA [51] HOLES
1 1/4" DIA [32] KNOCKOUT
CONDENSER COIL
CONDENSER COIL
SHEET 1 OF 2
DATE 11/15/12
SUPERCEDES -
TARGET 48HC 24 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT AND ERV
50HE503069
REV -

C12777

Fig. 20 - 48HC-24 Single Zone Electric Cooling with Gas Heat and ERV (Sheet 1 of 2)

APPENDIX A — CERTIFIED DIMENSION DRAWINGS

UNIT	STD. UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
48HC24	3270	1486	1179	536	577	262	497	226	1017	462	39 7/8 (1013)	46 3/8 (1179)	19 (483)

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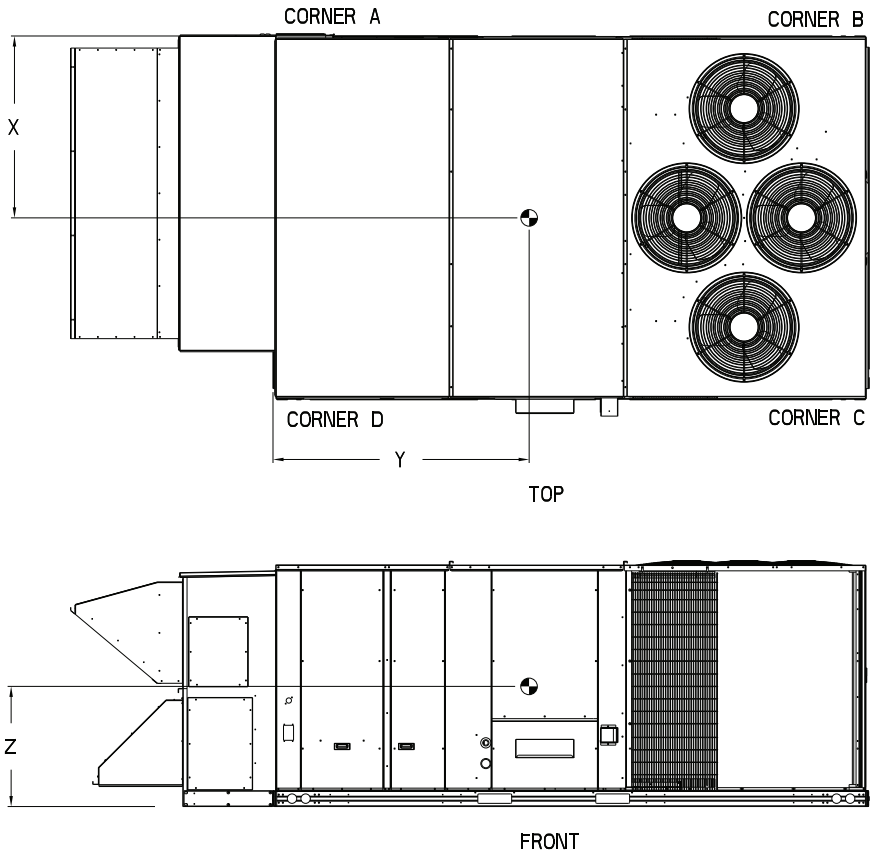
* STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.



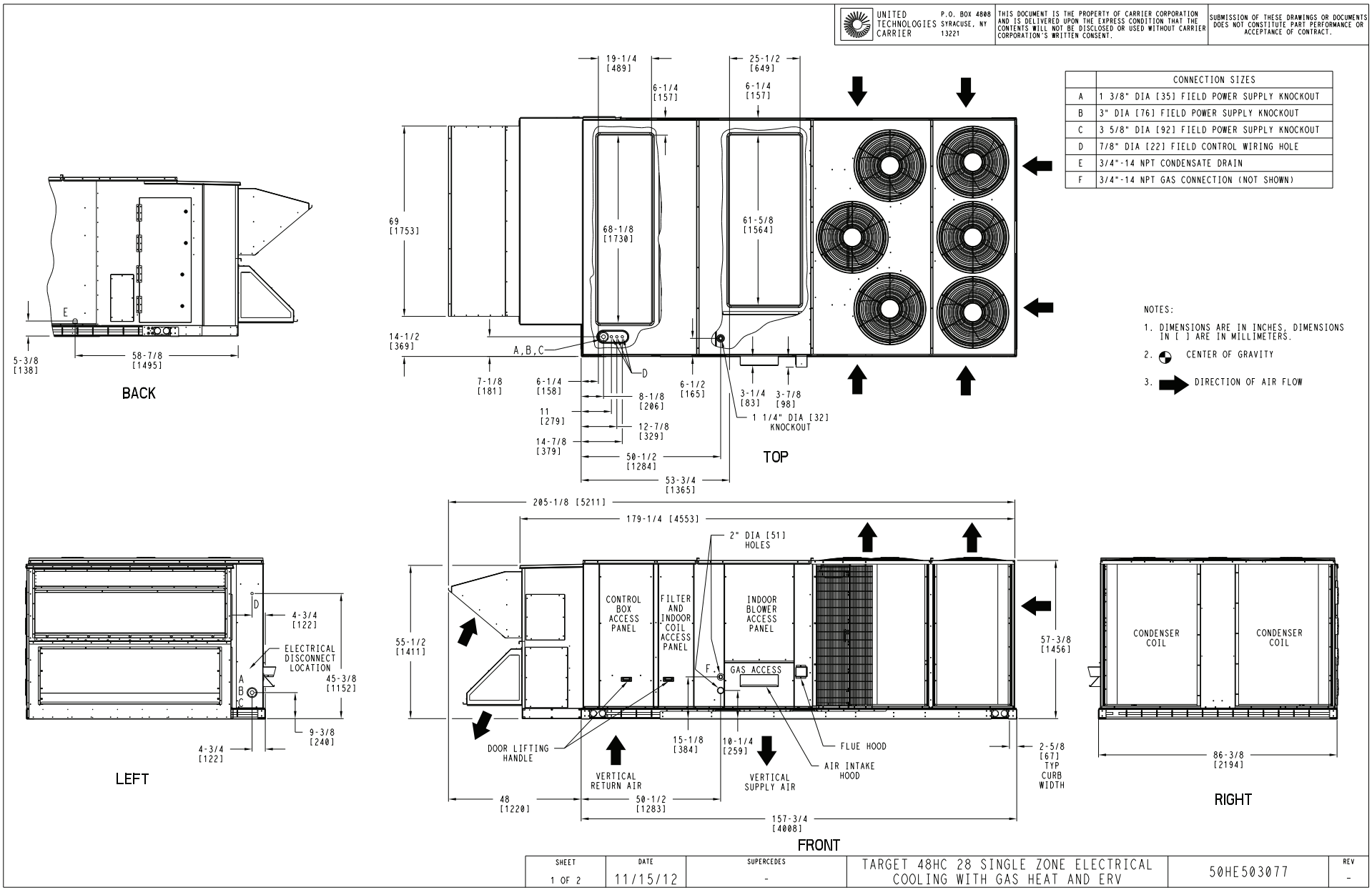
SHEET	DATE	SUPERCEDES			REV
2 OF 2	11/15/12	-	TARGET 48HC 24 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT AND ERV	50HE503069	-

C12778

Fig. 21 - 48HC-24 Single Zone Electric Cooling with Gas Heat and ERV (Sheet 2 of 2)

EnergyX

APPENDIX A — CERTIFIED DIMENSION DRAWINGS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SUBMISSION OF THESE DRAWINGS OR DOCUMENTS DOES NOT CONSTITUTE PART PERFORMANCE OR ACCEPTANCE OF CONTRACT.
CONNECTION SIZES
A 1 3/8" DIA [35] FIELD POWER SUPPLY KNOCKOUT
B 3" DIA [76] FIELD POWER SUPPLY KNOCKOUT
C 3 5/8" DIA [92] FIELD POWER SUPPLY KNOCKOUT
D 7/8" DIA [22] FIELD CONTROL WIRING HOLE
E 3/4"-14 NPT CONDENSATE DRAIN
F 3/4"-14 NPT GAS CONNECTION (NOT SHOWN)
NOTES:
1. DIMENSIONS ARE IN INCHES, DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. CENTER OF GRAVITY
3. DIRECTION OF AIR FLOW
BACK
TOP
LEFT
FRONT
RIGHT
CONTROL BOX ACCESS PANEL
FILTER AND INDOOR COIL ACCESS PANEL
INDOOR BLOWER ACCESS PANEL
GAS ACCESS
CONDENSER COIL
CONDENSER COIL
DOOR LIFTING HANDLE
VERTICAL RETURN AIR
VERTICAL SUPPLY AIR
AIR INTAKE HOOD
FLUE HOOD
ELECTRICAL DISCONNECT LOCATION
1 1/4" DIA [32] KNOCKOUT
2" DIA [51] HOLES
SHEET 1 OF 2
DATE 11/15/12
SUPERCEDES -
TARGET 48HC 28 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT AND ERV
50HE503077
REV -

C12779

Fig. 22 - 48HC-28 Single Zone Electric Cooling with Gas Heat and ERV (Sheet 1 of 2)

APPENDIX A — CERTIFIED DIMENSION DRAWINGS

UNIT	STD. UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
48HC28	3315	1507	1215	552	580	264	491	223	1029	468	39 1/2 (1003)	50 7/8 (1293)	19 (483)

* STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.

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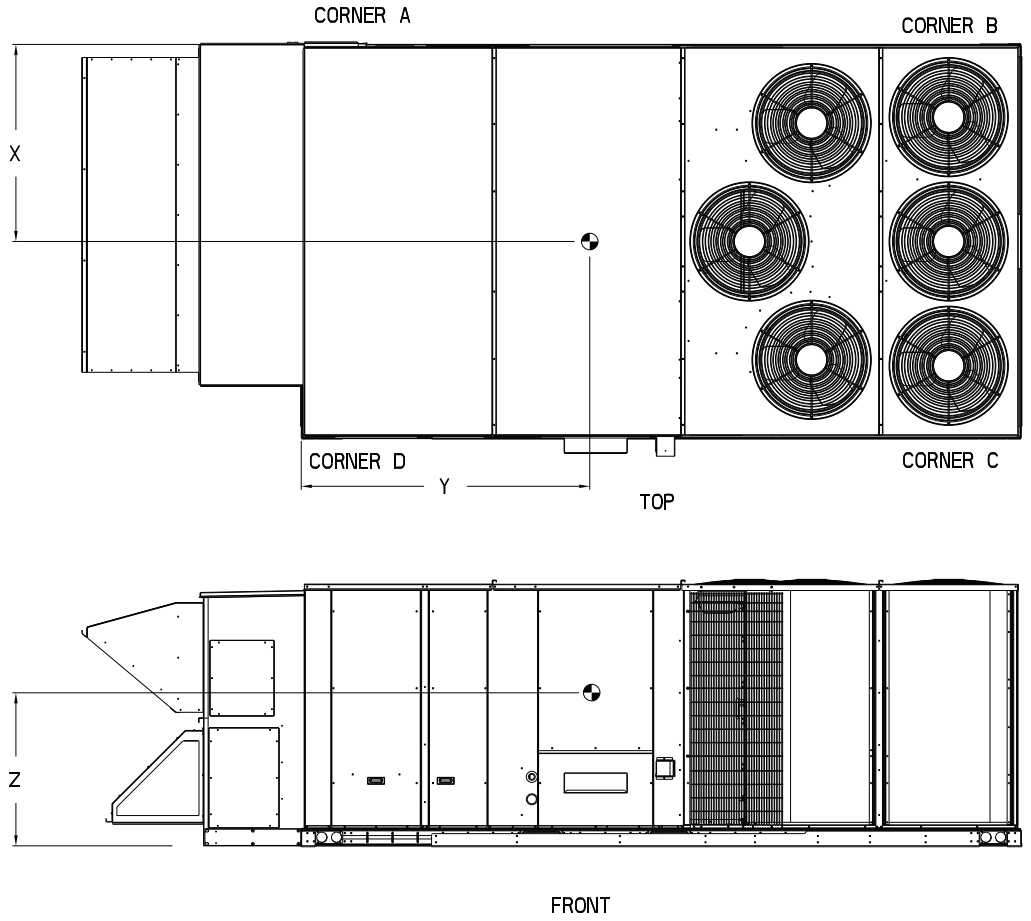

SHEET	DATE	SUPERCEDES			REV
2 OF 2	11/15/12	-	TARGET 48HC 28 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT AND ERV	50HE503077	-

C12780

Fig. 23 - 48HC-28 Single Zone Electric Cooling with Gas Heat and ERV (Sheet 2 of 2)

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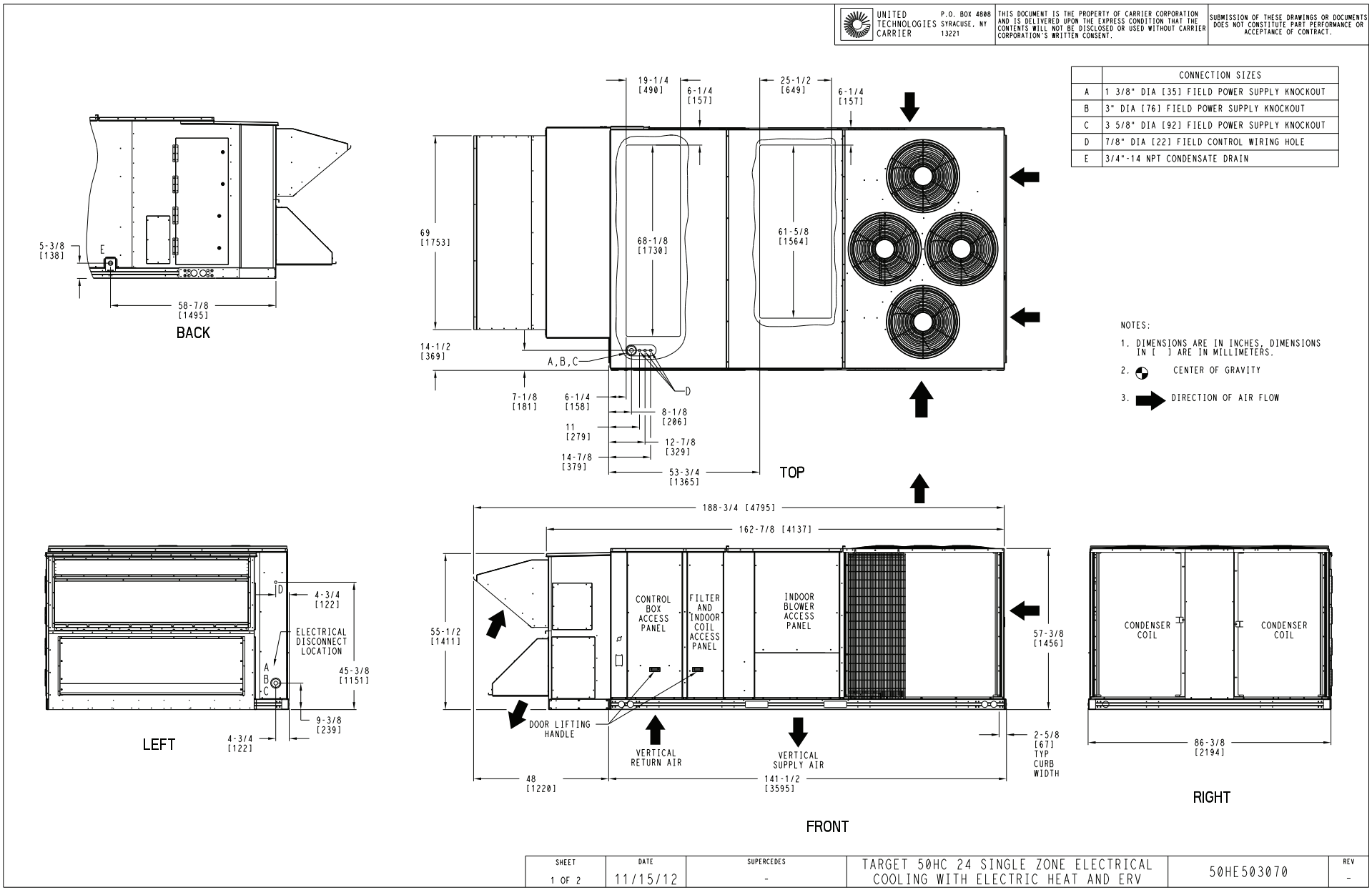
APPENDIX A — CERTIFIED DIMENSION DRAWINGS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CONNECTION SIZES
A 1 3/8" DIA [35] FIELD POWER SUPPLY KNOCKOUT
B 3" DIA [76] FIELD POWER SUPPLY KNOCKOUT
C 3 5/8" DIA [92] FIELD POWER SUPPLY KNOCKOUT
D 7/8" DIA [22] FIELD CONTROL WIRING HOLE
E 3/4"-14 NPT CONDENSATE DRAIN
NOTES:
1. DIMENSIONS ARE IN INCHES, DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. CENTER OF GRAVITY
3. DIRECTION OF AIR FLOW
BACK
TOP
LEFT
FRONT
RIGHT
CONTROL BOX ACCESS PANEL
FILTER AND INDOOR COIL ACCESS PANEL
INDOOR BLOWER ACCESS PANEL
CONDENSER COIL
DOOR LIFTING HANDLE
VERTICAL RETURN AIR
VERTICAL SUPPLY AIR
ELECTRICAL DISCONNECT LOCATION
SHEET 1 OF 2
DATE 11/15/12
SUPERCEDES -
TARGET 50HC 24 SINGLE ZONE ELECTRICAL COOLING WITH ELECTRIC HEAT AND ERV
50HE503070
REV -

C12781

Fig. 24 - 50HC-24 Single Zone Electric Cooling with Electric Heat and ERV (Sheet 1 of 2)

APPENDIX A — CERTIFIED DIMENSION DRAWINGS

UNIT	STD. UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
50HC24	3143	1428	1150	523	545	248	465	212	983	447	39 3/4 (1008)	45 3/8 (1153)	19 (483)

* STANDARD UNIT WEIGHT IS WITHOUT ELECTRIC HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.

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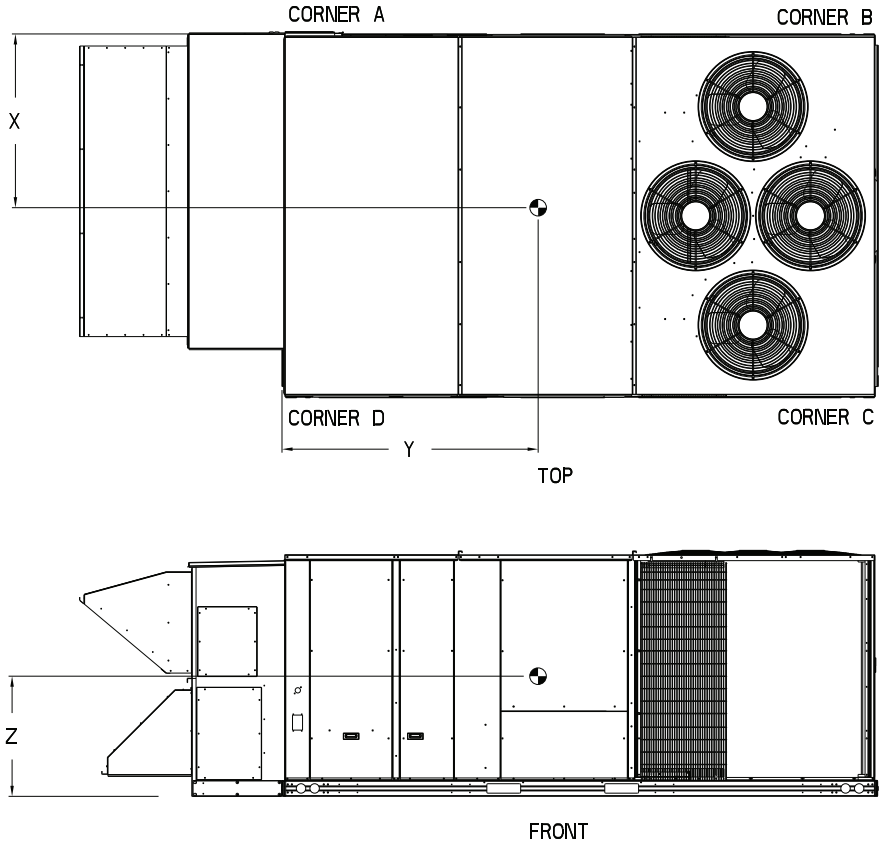


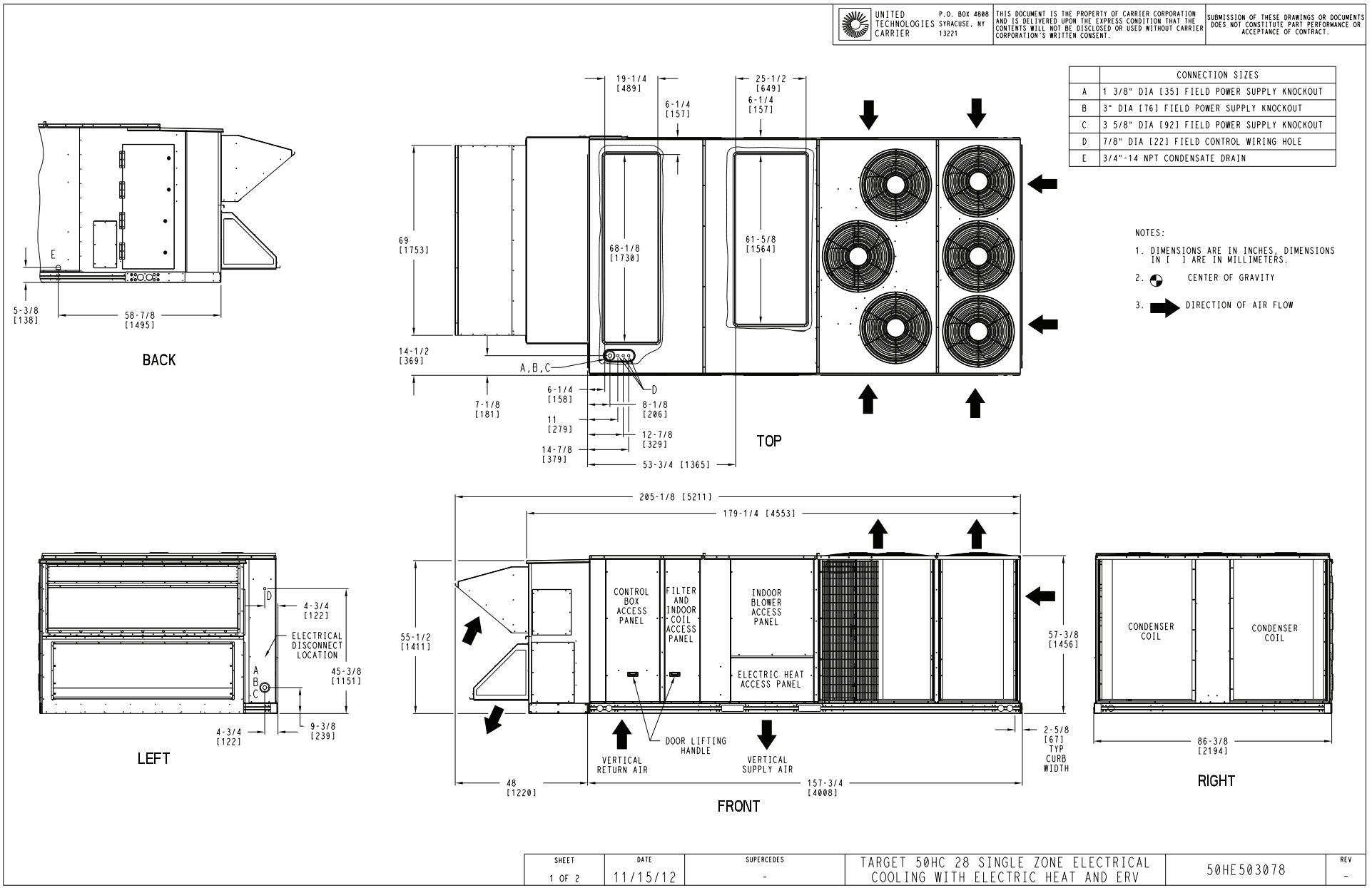
SHEET	DATE	SUPERCEDES			
2 OF 2	11/15/12	-	TARGET 50HC 24 SINGLE ZONE ELECTRICAL COOLING WITH ELECTRIC HEAT AND ERV	50HE503070	REV -

C12782

Fig. 25 - 50HC-24 Single Zone Electric Cooling with Electric Heat and ERV (Sheet 2 of 2)

EnergyX

APPENDIX A — CERTIFIED DIMENSION DRAWINGS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CONNECTION SIZES
A 1 3/8" DIA [35] FIELD POWER SUPPLY KNOCKOUT
B 3" DIA [76] FIELD POWER SUPPLY KNOCKOUT
C 3 5/8" DIA [92] FIELD POWER SUPPLY KNOCKOUT
D 7/8" DIA [22] FIELD CONTROL WIRING HOLE
E 3/4"-14 NPT CONDENSATE DRAIN
NOTES:
1. DIMENSIONS ARE IN INCHES, DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. CENTER OF GRAVITY
3. DIRECTION OF AIR FLOW
BACK
TOP
LEFT
FRONT
RIGHT
CONTROL BOX ACCESS PANEL
FILTER AND INDOOR COIL ACCESS PANEL
INDOOR BLOWER ACCESS PANEL
ELECTRIC HEAT ACCESS PANEL
ELECTRICAL DISCONNECT LOCATION
DOOR LIFTING HANDLE
VERTICAL RETURN AIR
VERTICAL SUPPLY AIR
CONDENSER COIL
CONDENSER COIL
2-5/8 [67] TYP CURB WIDTH
SHEET 1 OF 2
DATE 11/15/12
SUPERCEDES -
TARGET 50HC 28 SINGLE ZONE ELECTRICAL COOLING WITH ELECTRIC HEAT AND ERV
50HE503078
REV -

C12783

Fig. 26 - 50HC-28 Single Zone Electric Cooling with Electric Heat and ERV (Sheet 1 of 2)

APPENDIX A — CERTIFIED DIMENSION DRAWINGS

UNIT	STD. UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
50HC28	3188	1449	1185	538	548	249	460	209	995	452	39 3/8 (999)	49 7/8 (1266)	19 (483)

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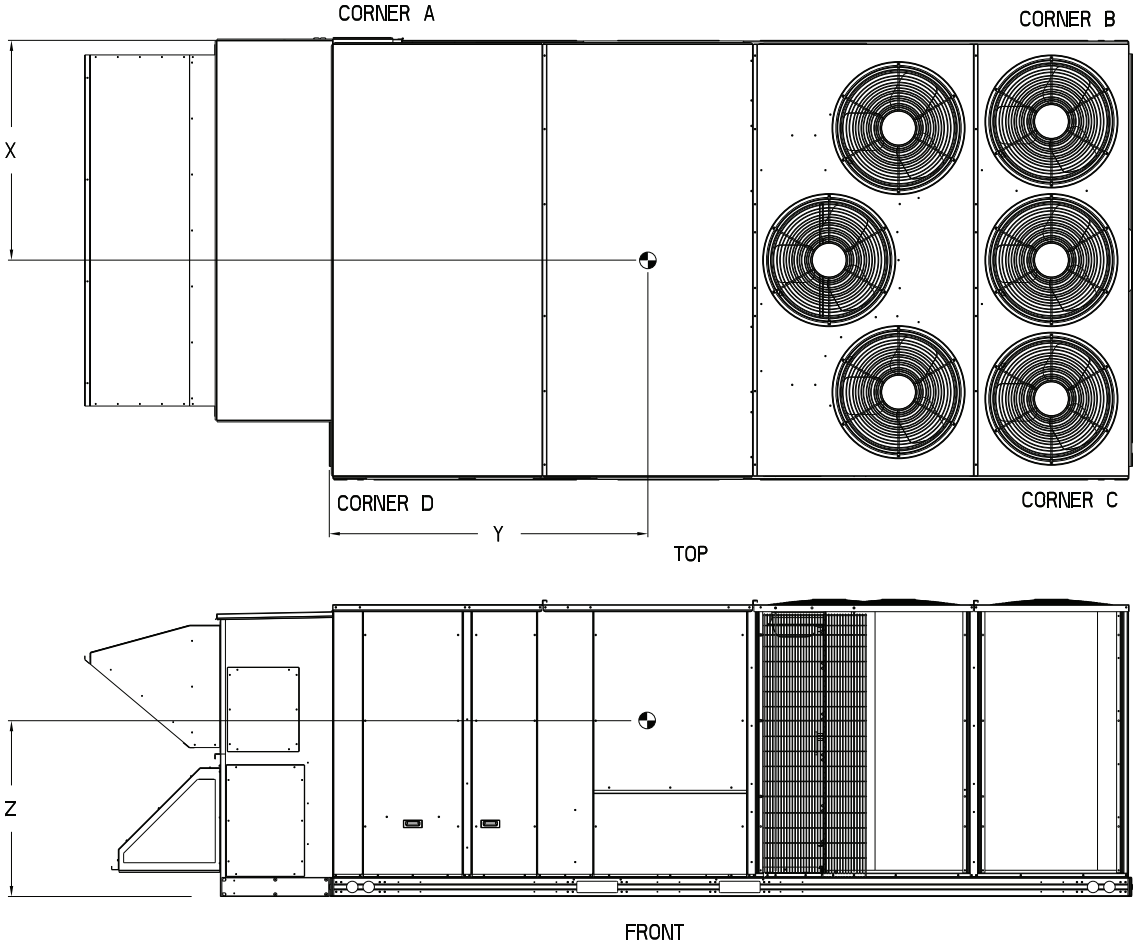
* STANDARD UNIT WEIGHT IS WITHOUT ELECTRIC HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.



SHEET	DATE	SUPERCEDES			REV
2 OF 2	11/15/12	-	TARGET 50HC 28 SINGLE ZONE ELECTRICAL COOLING WITH ELECTRIC HEAT AND ERV	50HE503078	-

C12784

Fig. 27 - 50HC-28 Single Zone Electric Cooling with Electric Heat and ERV (Sheet 2 of 2)

EnergyX

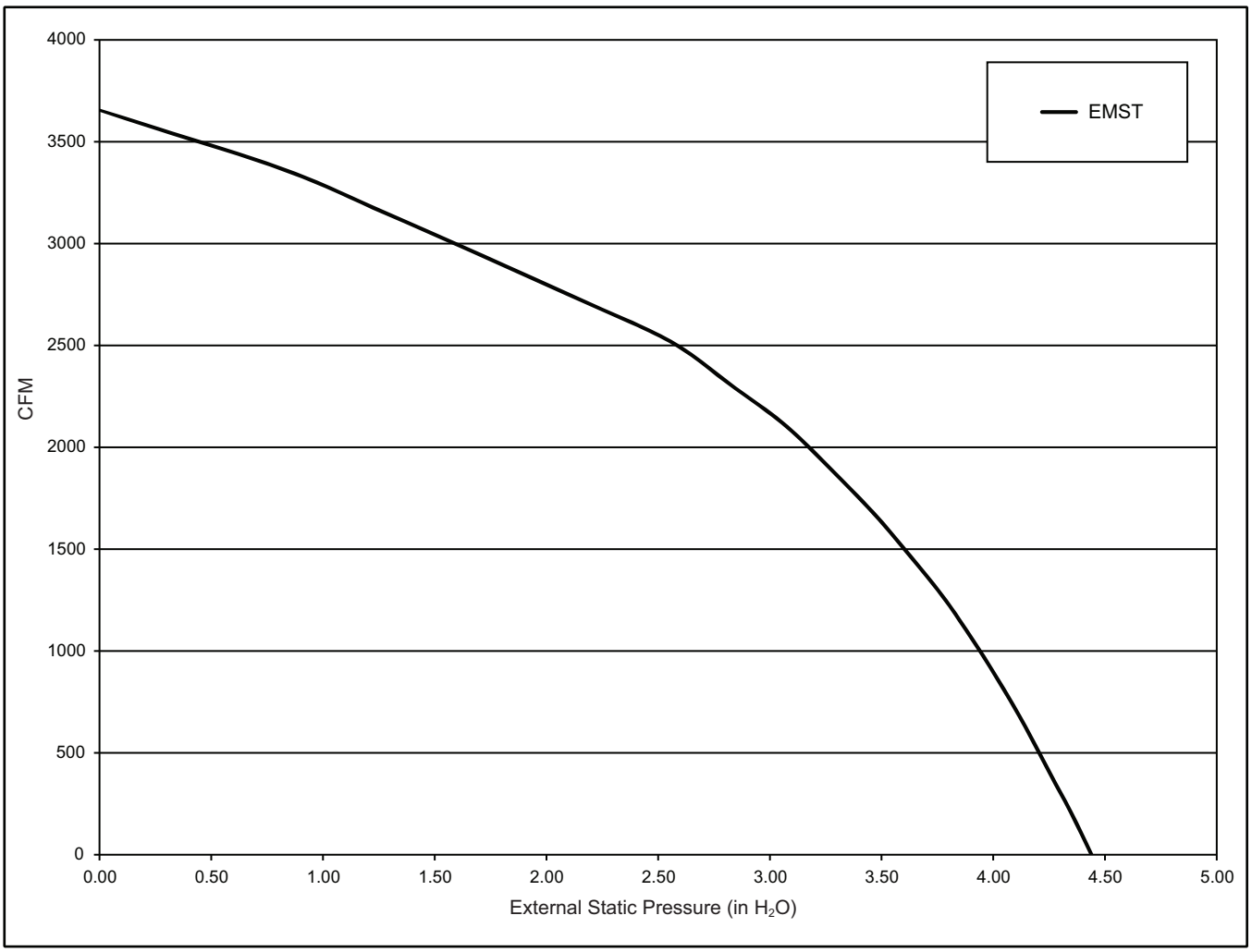
APPENDIX B — EXHAUST FAN PERFORMANCE

Many applications that utilize energy recovery incorporate ducted return/exhaust air paths. In these applications it is important to consider the duct pressure of the return/exhaust just as a designer would consider the effects of the supply duct static pressure on the airflow of the rooftop unit itself.

EnergyX Modulating Volume 20 & 25 Ton Units

The exhaust fan in the Modulated Volume EnergyX unit will assist the rooftop unit fan in pulling air through the exhaust/return duct. These exhaust fans are backwards curved impeller designs which are capable of significant more static pressure operation than typical forward curved fan designs. The following exhaust fan performance curves are provided for additional guidance when considering return/exhaust duct design.

NOTE: If application designs require two separate ducts (one for exhaust air, one for return air) contact your Carrier Sales Engineer for additional guidance prior to specification or ordering.



C12786

Fig. 30 - 20 & 25 Ton MRT Unit ERV Supply and Exhaust Fan Performance Curves

APPENDIX C — ELECTRICAL DATA

Table 8 – 48HC - with ERV: Unit Wire/Fuse or HACR Breaker Sizing Data

UNIT	NOM. V–Ph–Hz	IFM TYPE	NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
			w/ERV w/o Economizer				w/ERV w/Economizer*				w/ERV w/o Economizer				w/ERV w/Economizer*			
			MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
					FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
48HC**24	208/230–3–60	STD	119.6/118.7	150/150	129/128	583	119.6/118.7	150/150	129/128	583	124.4/123.5	150/150	134/133	588	124.4/123.5	150/150	134/133	588
		MED	123.1	150	133	579	123.1	150	133	579	127.9	150	138	584	127.9	150	138	584
		HIGH	134.5	150	146	658	134.5	150	146	658	139.3	150	152	663	139.3	150	152	663
	460–3–60	STD	61.7	70	66	295	61.7	70	66	295	63.9	80	69	297	63.9	80	69	297
		MED	63.9	80	69	293	63.9	80	69	293	66.1	80	71	295	66.1	80	71	295
		HIGH	69.6	80	75	333	69.6	80	75	333	71.8	80	78	335	71.8	80	78	335
	575–3–60	STD	49.6	60	54	219	49.6	60	54	219	51.3	60	55	221	51.3	60	55	221
		MED	51.6	60	56	217	51.6	60	56	217	53.3	60	58	219	53.3	60	58	219
		HIGH	53.5	60	58	244	53.5	60	58	244	55.2	60	60	246	55.2	60	60	246
48HC**28	208/230–3–60	STD	148.3/147.4	175/175	157/156	623	148.3/147.4	175/175	157/156	623	153.1/152.2	200/200	162/161	628	153.1/152.2	200/200	162/161	628
		MED	151.8	175	161	619	151.8	175	161	619	156.6	200	166	624	156.6	200	166	624
		HIGH	163.2	200	174	698	163.2	200	174	698	168.0	200	179	703	168.0	200	179	703
	460–3–60	STD	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
		MED	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
		HIGH	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
	575–3–60	STD	54.5	60	58	243	54.5	60	58	243	56.2	60	60	245	56.2	60	60	245
		MED	56.5	70	61	241	56.5	70	61	241	58.2	70	63	243	58.2	70	63	243
		HIGH	58.4	70	63	268	58.4	70	63	268	60.1	70	65	270	60.1	70	65	270

See: “Legend and Notes for Tables 8 – 15 on page 49

* Economizer not available for Target units equipped with ERV at this time.

EnergyX

APPENDIX C — ELECTRICAL DATA

Table 9 – 48HC - with ERV and Factory-Installed HACR Breaker

UNIT	NOM. V–Ph–Hz	IFM TYPE	NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
			w/ERV w/o Economizer				w/ERV w/Economizer*				w/ERV w/o Economizer				w/ERV w/Economizer*			
			MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE	
					FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
48HC**24	208/230–3–60	STD	119.6/119.6	150/150	129/128	583	119.6/119.6	150/150	129/128	583	124.4/124.4	150/150	134/133	588	124.4/124.4	150/150	134/133	588
		MED	123.1	150	133	579	123.1	150	133	579	127.9	150	138	584	127.9	150	138	584
		HIGH	134.5	150	146	658	134.5	150	146	658	139.3	150	152	663	139.3	150	152	663
	460–3–60	STD	61.7	70	66	295	61.7	70	66	295	63.9	80	69	297	63.9	80	69	297
		MED	63.9	80	69	293	63.9	80	69	293	66.1	80	71	295	66.1	80	71	295
		HIGH	69.6	80	75	333	69.6	80	75	333	71.8	80	78	335	71.8	80	78	335
	575–3–60	STD	49.6	60	54	219	49.6	60	54	219	51.3	60	55	221	51.3	60	55	221
		MED	51.6	60	56	217	51.6	60	56	217	53.3	60	58	219	53.3	60	58	219
		HIGH	53.5	60	58	244	53.5	60	58	244	55.2	60	60	246	55.2	60	60	246
48HC**28	208/230–3–60	STD	148.3/148.3	175/175	157/156	623	148.3/148.3	175/175	157/156	623	153.1/153.1	200/200	162/161	628	153.1/153.1	200/200	162/161	628
		MED	151.8	175	161	619	151.8	175	161	619	156.6	200	166	624	156.6	200	166	624
		HIGH	163.2	200	174	698	163.2	200	174	698	168.0	200	179	703	168.0	200	179	703
	460–3–60	STD	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
		MED	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
		HIGH	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
	575–3–60	STD	54.5	60	58	243	54.5	60	58	243	56.2	60	60	245	56.2	60	60	245
		MED	56.5	70	61	241	56.5	70	61	241	58.2	70	63	243	58.2	70	63	243
		HIGH	58.4	70	63	268	58.4	70	63	268	60.1	70	65	270	60.1	70	65	270

See: “Legend and Notes for Tables 8 – 15 on page 49

* Economizer not available for Target units equipped with ERV at this time.

APPENDIX C — ELECTRICAL DATA

Table 10 – 48HC - with ERV and 2-Speed Indoor Fan Option

UNIT	NOM. V–Ph–Hz	IFM TYPE	NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
			w/ERV w/o Economizer				w/ERV w/Economizer*				w/ERV w/o Economizer				w/ERV w/Economizer*			
			MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
					FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
48HC**24	208/230–3–60	STD	119.6/118.7	150/150	129/128	583	119.6/118.7	150/150	129/128	583	124.4/123.5	150/150	134/133	588	124.4/123.5	150/150	134/133	588
		MED	123.1	150	133	579	123.1	150	133	579	127.9	150	138	584	127.9	150	138	584
		HIGH	134.5	150	146	658	134.5	150	146	658	139.3	150	152	663	139.3	150	152	663
	460–3–60	STD	61.7	70	66	295	61.7	70	66	295	63.9	80	69	297	63.9	80	69	297
		MED	63.9	80	69	293	63.9	80	69	293	66.1	80	71	295	66.1	80	71	295
		HIGH	69.6	80	75	333	69.6	80	75	333	71.8	80	78	335	71.8	80	78	335
	575–3–60	STD	50.2	60	54	219	50.2	60	54	219	51.9	60	56	221	51.9	60	56	221
		MED	51.6	60	56	217	51.6	60	56	217	53.3	60	58	219	53.3	60	58	219
		HIGH	53.5	60	58	244	53.5	60	58	244	55.2	60	60	246	55.2	60	60	246
48HC**28	208/230–3–60	STD	148.3/147.4	175/175	157/156	623	148.3/147.4	175/175	157/156	623	153.1/152.2	200/200	162/161	628	153.1/152.2	200/200	162/161	628
		MED	151.8	175	161	619	151.8	175	161	619	156.6	200	166	624	156.6	200	166	624
		HIGH	163.2	200	174	698	163.2	200	174	698	168.0	200	179	703	168.0	200	179	703
	460–3–60	STD	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
		MED	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
		HIGH	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
	575–3–60	STD	55.1	60	59	243	55.1	60	59	243	56.8	70	61	245	56.8	70	61	245
		MED	56.5	70	61	241	56.5	70	61	241	58.2	70	63	243	58.2	70	63	243
		HIGH	58.4	70	63	268	58.4	70	63	268	60.1	70	65	270	60.1	70	65	270

See: “Legend and Notes for Tables 8 – 15 on page 49

* Economizer not available for Target units equipped with ERV at this time.

APPENDIX C — ELECTRICAL DATA

Table 11 – 48HC - with ERV, Factory-installed HACR Breaker and 2-Speed Indoor Fan Option

UNIT	NOM. V–Ph–Hz	IFM TYPE	NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
			w/ERV w/o Economizer				w/ERV w/Economizer*				w/ERV w/o Economizer				w/ERV w/Economizer*			
			MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE	
					FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
48HC**24	208/230–3–60	STD	119.6/119.6	150/150	129/128	583	119.6/119.6	150/150	129/128	583	124.4/124.4	150/150	134/133	588	124.4/124.4	150/150	134/133	588
		MED	123.1	150	133	579	123.1	150	133	579	127.9	150	138	584	127.9	150	138	584
		HIGH	134.5	150	146	658	134.5	150	146	658	139.3	150	152	663	139.3	150	152	663
	460–3–60	STD	61.7	70	66	295	61.7	70	66	295	63.9	80	69	297	63.9	80	69	297
		MED	63.9	80	69	293	63.9	80	69	293	66.1	80	71	295	66.1	80	71	295
		HIGH	69.6	80	75	333	69.6	80	75	333	71.8	80	78	335	71.8	80	78	335
	575–3–60	STD	50.2	60	54	219	50.2	60	54	219	51.9	60	56	221	51.9	60	56	221
		MED	51.6	60	56	217	51.6	60	56	217	53.3	60	58	219	53.3	60	58	219
		HIGH	53.5	60	58	244	53.5	60	58	244	55.2	60	60	246	55.2	60	60	246
48HC**28	208/230–3–60	STD	148.3/148.3	175/175	157/156	623	148.3/148.3	175/175	157/156	623	153.1/153.1	200/200	162/161	628	153.1/153.1	200/200	162/161	628
		MED	151.8	175	161	619	151.8	175	161	619	156.6	200	166	624	156.6	200	166	624
		HIGH	163.2	200	174	698	163.2	200	174	698	168.0	200	179	703	168.0	200	179	703
	460–3–60	STD	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
		MED	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
		HIGH	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
	575–3–60	STD	55.1	60	59	243	55.1	60	59	243	56.8	70	61	245	56.8	70	61	245
		MED	56.5	70	61	241	56.5	70	61	241	58.2	70	63	243	58.2	70	63	243
		HIGH	58.4	70	63	268	58.4	70	63	268	60.1	70	65	270	60.1	70	65	270

See: “Legend and Notes for Tables 8 – 15 on page 49

* Economizer not available for Target units equipped with ERV at this time.

APPENDIX C — ELECTRICAL DATA

Table 12 – 50HC - With Electric Heat and ERV: Unit Wire/Fuse or HACR Breaker Sizing Data

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ERV w/o Economizer				w/ERV w/Economizer*				w/ERV w/o Economizer				w/ERV w/Economizer*			
			CRHEATER	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **24	208/230–3–60	STD	NONE	–	–	119.6/118.7	150/150	129/128	583	119.6/118.7	150/150	129/128	583	124.4/123.5	150/150	134/133	588	124.4/123.5	150/150	134/133	588
			279A00	18.8/25.0	52.1/60.1	122.5/131.4	150/150	129/128	583/583	122.5/131.4	150/150	129/128	583/583	128.5/137.4	150/150	134/133	588/588	128.5/137.4	150/150	134/133	588/588
			280A00	37.6/50.0	104.2/120.3	187.7/176.6	200/200	173/190	583/583	187.7/176.6	200/200	173/190	583/583	193.7/182.6	200/200	178/196	588/588	193.7/182.6	200/200	178/196	588/588
			281A00	56.3/75.0	156.4/180.4	213.8/236.7	225/250	233/259	583/583	213.8/236.7	225/250	233/259	583/583	219.8/242.7	225/250	238/265	588/588	219.8/242.7	225/250	238/265	588/588
		MED	NONE	–	–	123.1	150	133	579	123.1	150	133	579	127.9	150	138	584	127.9	150	138	584
			279A00	18.8/25.0	52.1/60.1	126.9/136.9	150/150	133/133	579/579	126.9/136.9	150/150	133/133	579/579	132.9/142.9	150/150	138/138	584/584	132.9/142.9	150/150	138/138	584/584
			280A00	37.6/50.0	104.2/120.3	192.0/182.1	200/200	177/195	579/579	192.0/182.1	200/200	177/195	579/579	198.0/188.1	200/200	182/201	584/584	198.0/188.1	200/200	182/201	584/584
			281A00	56.3/75.0	156.4/180.4	218.2/242.2	225/250	237/264	579/579	218.2/242.2	225/250	237/264	579/579	224.2/248.2	225/250	242/270	584/584	224.2/248.2	225/250	242/270	584/584
		HIGH	NONE	–	–	134.5	150	146	658	134.5	150	146	658	139.3	150	152	663	139.3	150	152	663
			279A00	18.8/25.0	52.1/60.1	141.2/151.2	150/175	146/146	658/658	141.2/151.2	150/175	146/146	658/658	147.2/157.2	150/175	152/152	663/663	147.2/157.2	150/175	152/152	663/663
			280A00	37.6/50.0	104.2/120.3	206.3/196.3	225/200	190/208	658/658	206.3/196.3	225/200	190/208	658/658	212.3/202.3	225/225	195/214	663/663	212.3/202.3	225/225	195/214	663/663
			281A00	56.3/75.0	156.4/180.4	232.4/256.4	250/300	250/277	658/658	232.4/256.4	250/300	250/277	658/658	238.4/262.4	250/300	255/283	663/663	238.4/262.4	250/300	255/283	663/663
	460–3–60	STD	NONE	–	–	61.7	70	66	295	61.7	70	66	295	63.9	80	69	297	63.9	80	69	297
			282A00	25.0	30.1	63.3	70	66	295	63.3	70	66	295	66.1	80	69	297	66.1	80	69	297
			283A00	50.0	60.1	85.8	90	93	295	85.8	90	93	295	88.6	90	95	297	88.6	90	95	297
			284A00	75.0	90.2	115.9	125	127	295	115.9	125	127	295	118.7	125	130	297	118.7	125	130	297
		MED	NONE	–	–	63.9	80	69	293	63.9	80	69	293	66.1	80	71	295	66.1	80	71	295
			282A00	25.0	30.1	66.1	80	69	293	66.1	80	69	293	68.8	80	71	295	68.8	80	71	295
			283A00	50.0	60.1	88.6	90	95	293	88.6	90	95	293	91.3	100	98	295	91.3	100	98	295
			284A00	75.0	90.2	118.7	125	130	293	118.7	125	130	293	121.4	125	132	295	121.4	125	132	295
		HIGH	NONE	–	–	69.6	80	75	333	69.6	80	75	333	71.8	80	78	335	71.8	80	78	335
			282A00	25.0	30.1	73.2	80	75	333	73.2	80	75	333	76.0	80	78	335	76.0	80	78	335
			283A00	50.0	60.1	95.7	100	102	333	95.7	100	102	333	98.4	100	104	335	98.4	100	104	335
			284A00	75.0	90.2	125.8	150	136	333	125.8	150	136	333	128.5	150	139	335	128.5	150	139	335
	575–3–60	STD	NONE	–	–	49.6	60	54	219	49.6	60	54	219	51.3	60	55	221	51.3	60	55	221
			285A00	24.8	23.9	54.6	60	54	219	54.6	60	54	219	56.7	60	55	221	56.7	60	55	221
			286A00	49.6	47.7	84.3	90	78	219	84.3	90	78	219	86.5	90	80	221	86.5	90	80	221
			287A00	74.4	71.6	96.3	100	105	219	96.3	100	105	219	98.4	100	107	221	98.4	100	107	221
		MED	NONE	–	–	51.6	60	56	217	51.6	60	56	217	53.3	60	58	219	53.3	60	58	219
			285A00	24.8	23.9	57.1	60	56	217	57.1	60	56	217	59.2	60	58	219	59.2	60	58	219
			286A00	49.6	47.7	86.8	90	80	217	86.8	90	80	217	89.0	90	82	219	89.0	90	82	219
			287A00	74.4	71.6	98.8	100	107	217	98.8	100	107	217	100.9	110	109	219	100.9	110	109	219
		HIGH	NONE	–	–	53.5	60	58	244	53.5	60	58	244	55.2	60	60	246	55.2	60	60	246
			285A00	24.8	23.9	59.5	60	58	244	59.5	60	58	244	61.6	70	60	246	61.6	70	60	246
			286A00	49.6	47.7	89.2	90	82	244	89.2	90	82	244	91.3	100	84	246	91.3	100	84	246
			287A00	74.4	71.6	101.2	110	110	244	101.2	110	110	244	103.3	110	112	246	103.3	110	112	246

See: “Legend and Notes for Tables 8 – 15 on page 49

* Economizer not available for Target units equipped with ERV at this time.

EnergyX

APPENDIX C — ELECTRICAL DATA

Table 12 - 50HC - With Electric Heat and ERV: Unit Wire/Fuse or HACR Breaker Sizing Data (cont.)

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ERV w/o Economizer				w/ERV w/Economizer*				w/ERV w/o Economizer				w/ERV w/Economizer*			
			CRHEATER	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **28	208/230–3–60	STD	NONE	–	–	148.3/147.4	175/175	157/156	623	148.3/147.4	175/175	157/156	623	153.1/152.2	200/200	162/161	628	153.1/152.2	200/200	162/161	628
			279A00	18.8/25.0	52.1/60.1	148.3/147.4	175/175	157/156	623/623	148.3/147.4	175/175	157/156	623/623	153.1/152.2	200/200	162/161	628/628	153.1/152.2	200/200	162/161	628/628
			280A00	37.6/50.0	104.2/120.3	187.7/176.6	200/200	173/190	623/623	187.7/176.6	200/200	173/190	623/623	193.7/182.6	200/200	178/196	628/628	193.7/182.6	200/200	178/196	628/628
			281A00	56.3/75.0	156.4/180.4	213.8/236.7	225/250	233/259	623/623	213.8/236.7	225/250	233/259	623/623	219.8/242.7	225/250	238/265	628/628	219.8/242.7	225/250	238/265	628/628
		MED	NONE	–	–	151.8	175	161	619	151.8	175	161	619	156.6	200	166	624	156.6	200	166	624
			279A00	18.8/25.0	52.1/60.1	151.8/151.8	175/175	161/161	619/619	151.8/151.8	175/175	161/161	619/619	156.6/156.6	200/200	166/166	624/624	156.6/156.6	200/200	166/166	624/624
			280A00	37.6/50.0	104.2/120.3	192.0/182.1	200/200	177/195	619/619	192.0/182.1	200/200	177/195	619/619	198.0/188.1	200/200	182/201	624/624	198.0/188.1	200/200	182/201	624/624
			281A00	56.3/75.0	156.4/180.4	218.2/242.2	225/250	237/264	619/619	218.2/242.2	225/250	237/264	619/619	224.2/248.2	225/250	242/270	624/624	224.2/248.2	225/250	242/270	624/624
		HIGH	NONE	–	–	163.2	200	174	698	163.2	200	174	698	168.0	200	179	703	168.0	200	179	703
			279A00	18.8/25.0	52.1/60.1	163.2/163.2	200/200	174/174	698/698	163.2/163.2	200/200	174/174	698/698	168.0/168.0	200/200	179/179	703/703	168.0/168.0	200/200	179/179	703/703
			280A00	37.6/50.0	104.2/120.3	206.3/196.3	225/200	190/208	698/698	206.3/196.3	225/200	190/208	698/698	212.3/202.3	225/225	195/214	703/703	212.3/202.3	225/225	195/214	703/703
			281A00	56.3/75.0	156.4/180.4	232.4/256.4	250/300	250/277	698/698	232.4/256.4	250/300	250/277	698/698	238.4/262.4	250/300	255/283	703/703	238.4/262.4	250/300	255/283	703/703
	460–3–60	STD	NONE	–	–	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
			282A00	25.0	30.1	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
			283A00	50.0	60.1	85.8	90	93	321	85.8	90	93	321	88.6	90	95	323	88.6	90	95	323
			284A00	75.0	90.2	115.9	125	127	321	115.9	125	127	321	118.7	125	130	323	118.7	125	130	323
		MED	NONE	–	–	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
			282A00	25.0	30.1	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
			283A00	50.0	60.1	88.6	90	95	319	88.6	90	95	319	91.3	100	98	321	91.3	100	98	321
			284A00	75.0	90.2	118.7	125	130	319	118.7	125	130	319	121.4	125	132	321	121.4	125	132	321
		HIGH	NONE	–	–	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
			282A00	25.0	30.1	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
			283A00	50.0	60.1	95.7	100	102	359	95.7	100	102	359	98.4	100	104	361	98.4	100	104	361
			284A00	75.0	90.2	125.8	150	136	359	125.8	150	136	359	128.5	150	139	361	128.5	150	139	361
	575–3–60	STD	NONE	–	–	54.5	60	58	243	54.5	60	58	243	56.2	60	60	245	56.2	60	60	245
			285A00	24.8	23.9	54.6	60	58	243	54.6	60	58	243	56.7	60	60	245	56.7	60	60	245
			286A00	49.6	47.7	84.3	90	78	243	84.3	90	78	243	86.5	90	80	245	86.5	90	80	245
			287A00	74.4	71.6	96.3	100	105	243	96.3	100	105	243	98.4	100	107	245	98.4	100	107	245
		MED	NONE	–	–	56.5	70	61	241	56.5	70	61	241	58.2	70	63	243	58.2	70	63	243
			285A00	24.8	23.9	57.1	70	61	241	57.1	70	61	241	59.2	70	63	243	59.2	70	63	243
			286A00	49.6	47.7	86.8	90	80	241	86.8	90	80	241	89.0	90	82	243	89.0	90	82	243
			287A00	74.4	71.6	98.8	100	107	241	98.8	100	107	241	100.9	110	109	243	100.9	110	109	243
		HIGH	NONE	–	–	58.4	70	63	268	58.4	70	63	268	60.1	70	65	270	60.1	70	65	270
			285A00	24.8	23.9	59.5	70	63	268	59.5	70	63	268	61.6	70	65	270	61.6	70	65	270
			286A00	49.6	47.7	89.2	90	82	268	89.2	90	82	268	91.3	100	84	270	91.3	100	84	270
			287A00	74.4	71.6	101.2	110	110	268	101.2	110	110	268	103.3	110	112	270	103.3	110	112	270

See: "Legend and Notes for Tables 8 – 15 on page 49

* Economizer not available for Target units equipped with ERV at this time.

APPENDIX C — ELECTRICAL DATA

Table 13 – 50HC - With Electric Heat, ERV and Factory-Installed HACR Breaker

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ERV w/o Economizer				w/ERV w/Economizer*				w/ERV w/o Economizer				w/ERV w/Economizer*			
			CRHEATER	Nom (kW)	FLA	MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **24	208/230–3–60	STD	NONE	–	–	119.6/119.6	150/150	129/128	583	119.6/119.6	150/150	129/128	583	124.4/124.4	150/150	134/133	588	124.4/124.4	150/150	134/133	588
			279A00	18.8/25.0	52.1/60.1	131.4/131.4	150/150	129/128	583/583	131.4/131.4	150/150	129/128	583/583	137.4/137.4	150/150	134/133	588/588	137.4/137.4	150/150	134/133	588/588
			280A00	37.6/50.0	104.2/120.3	187.7/187.7	200/200	173/190	583/583	187.7/187.7	200/200	173/190	583/583	193.7/193.7	200/200	178/196	588/588	193.7/193.7	200/200	178/196	588/588
			281A00	56.3/75.0	156.4/180.4	236.7/236.7	250/250	233/259	583/583	236.7/236.7	250/250	233/259	583/583	242.7/242.7	250/250	238/265	588/588	242.7/242.7	250/250	238/265	588/588
		MED	NONE	–	–	123.1	150	133	579	123.1	150	133	579	127.9	150	138	584	127.9	150	138	584
			279A00	18.8/25.0	52.1/60.1	136.9/136.9	150/150	133/133	579/579	136.9/136.9	150/150	133/133	579/579	142.9/142.9	150/150	138/138	584/584	142.9/142.9	150/150	138/138	584/584
			280A00	37.6/50.0	104.2/120.3	192.0/192.0	200/200	177/195	579/579	192.0/192.0	200/200	177/195	579/579	198.0/198.0	200/200	182/201	584/584	198.0/198.0	200/200	182/201	584/584
			281A00	56.3/75.0	156.4/180.4	242.2/242.2	250/250	237/264	579/579	242.2/242.2	250/250	237/264	579/579	248.2/248.2	250/250	242/270	584/584	248.2/248.2	250/250	242/270	584/584
		HIGH	NONE	–	–	134.5	150	146	658	134.5	150	146	658	139.3	150	152	663	139.3	150	152	663
			279A00	18.8/25.0	52.1/60.1	151.2/151.2	175/175	146/146	658/658	151.2/151.2	175/175	146/146	658/658	157.2/157.2	175/175	152/152	663/663	157.2/157.2	175/175	152/152	663/663
			280A00	37.6/50.0	104.2/120.3	206.3/206.3	225/225	190/208	658/658	206.3/206.3	225/225	190/208	658/658	212.3/212.3	225/225	195/214	663/663	212.3/212.3	225/225	195/214	663/663
			281A00	56.3/75.0	156.4/180.4	256.4/256.4	300/300	250/277	658/658	256.4/256.4	300/300	250/277	658/658	262.4/262.4	300/300	255/283	663/663	262.4/262.4	300/300	255/283	663/663
	460–3–60	STD	NONE	–	–	61.7	70	66	295	61.7	70	66	295	63.9	80	69	297	63.9	80	69	297
			282A00	25.0	30.1	63.3	70	66	295	63.3	70	66	295	66.1	80	69	297	66.1	80	69	297
			283A00	50.0	60.1	85.8	90	93	295	85.8	90	93	295	88.6	90	95	297	88.6	90	95	297
			284A00	75.0	90.2	115.9	125	127	295	115.9	125	127	295	118.7	125	130	297	118.7	125	130	297
		MED	NONE	–	–	63.9	80	69	293	63.9	80	69	293	66.1	80	71	295	66.1	80	71	295
			282A00	25.0	30.1	66.1	80	69	293	66.1	80	69	293	68.8	80	71	295	68.8	80	71	295
			283A00	50.0	60.1	88.6	90	95	293	88.6	90	95	293	91.3	100	98	295	91.3	100	98	295
			284A00	75.0	90.2	118.7	125	130	293	118.7	125	130	293	121.4	125	132	295	121.4	125	132	295
		HIGH	NONE	–	–	69.6	80	75	333	69.6	80	75	333	71.8	80	78	335	71.8	80	78	335
			282A00	25.0	30.1	73.2	80	75	333	73.2	80	75	333	76.0	80	78	335	76.0	80	78	335
			283A00	50.0	60.1	95.7	100	102	333	95.7	100	102	333	98.4	100	104	335	98.4	100	104	335
			284A00	75.0	90.2	125.8	150	136	333	125.8	150	136	333	128.5	150	139	335	128.5	150	139	335
	575–3–60	STD	NONE	–	–	49.6	60	54	219	49.6	60	54	219	51.3	60	55	221	51.3	60	55	221
			285A00	24.8	23.9	54.6	60	54	219	54.6	60	54	219	56.7	60	55	221	56.7	60	55	221
			286A00	49.6	47.7	84.3	90	78	219	84.3	90	78	219	86.5	90	80	221	86.5	90	80	221
			287A00	74.4	71.6	96.3	100	105	219	96.3	100	105	219	98.4	100	107	221	98.4	100	107	221
		MED	NONE	–	–	51.6	60	56	217	51.6	60	56	217	53.3	60	58	219	53.3	60	58	219
			285A00	24.8	23.9	57.1	60	56	217	57.1	60	56	217	59.2	60	58	219	59.2	60	58	219
			286A00	49.6	47.7	86.8	90	80	217	86.8	90	80	217	89.0	90	82	219	89.0	90	82	219
			287A00	74.4	71.6	98.8	100	107	217	98.8	100	107	217	100.9	110	109	219	100.9	110	109	219
		HIGH	NONE	–	–	53.5	60	58	244	53.5	60	58	244	55.2	60	60	246	55.2	60	60	246
			285A00	24.8	23.9	59.5	60	58	244	59.5	60	58	244	61.6	70	60	246	61.6	70	60	246
			286A00	49.6	47.7	89.2	90	82	244	89.2	90	82	244	91.3	100	84	246	91.3	100	84	246
			287A00	74.4	71.6	101.2	110	110	244	101.2	110	110	244	103.3	110	112	246	103.3	110	112	246

See: “Legend and Notes for Tables 8 – 15 on page 49

* Economizer not available for Target units equipped with ERV at this time.

EnergyX

APPENDIX C — ELECTRICAL DATA

Table 13 - 50HC - With Electric Heat, ERV and Factory-Installed HACR Breaker (cont.)

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ERV w/o Economizer				w/ERV w/Economizer*				w/ERV w/o Economizer				w/ERV w/Economizer*			
			CRHEATER	Nom (kW)	FLA	MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **28	208/230–3–60	STD	NONE	–	–	148.3/148.3	175/175	157/156	623	148.3/148.3	175/175	157/156	623	153.1/153.1	200/200	162/161	628	153.1/153.1	200/200	162/161	628
			279A00	18.8/25.0	52.1/60.1	148.3/148.3	175/175	157/156	623/623	148.3/148.3	175/175	157/156	623/623	153.1/153.1	200/200	162/161	628/628	153.1/153.1	200/200	162/161	628/628
			280A00	37.6/50.0	104.2/120.3	187.7/187.7	200/200	173/190	623/623	187.7/187.7	200/200	173/190	623/623	193.7/193.7	200/200	178/196	628/628	193.7/193.7	200/200	178/196	628/628
			281A00	56.3/75.0	156.4/180.4	236.7/236.7	250/250	233/259	623/623	236.7/236.7	250/250	233/259	623/623	242.7/242.7	250/250	238/265	628/628	242.7/242.7	250/250	238/265	628/628
		MED	NONE	–	–	151.8	175	161	619	151.8	175	161	619	156.6	200	166	624	156.6	200	166	624
			279A00	18.8/25.0	52.1/60.1	151.8/151.8	175/175	161/161	619/619	151.8/151.8	175/175	161/161	619/619	156.6/156.6	200/200	166/166	624/624	156.6/156.6	200/200	166/166	624/624
			280A00	37.6/50.0	104.2/120.3	192.0/192.0	200/200	177/195	619/619	192.0/192.0	200/200	177/195	619/619	198.0/198.0	200/200	182/201	624/624	198.0/198.0	200/200	182/201	624/624
			281A00	56.3/75.0	156.4/180.4	242.2/242.2	250/250	237/264	619/619	242.2/242.2	250/250	237/264	619/619	248.2/248.2	250/250	242/270	624/624	248.2/248.2	250/250	242/270	624/624
		HIGH	NONE	–	–	163.2	200	174	698	163.2	200	174	698	168.0	200	179	703	168.0	200	179	703
			279A00	18.8/25.0	52.1/60.1	163.2/163.2	200/200	174/174	698/698	163.2/163.2	200/200	174/174	698/698	168.0/168.0	200/200	179/179	703/703	168.0/168.0	200/200	179/179	703/703
			280A00	37.6/50.0	104.2/120.3	206.3/206.3	225/225	190/208	698/698	206.3/206.3	225/225	190/208	698/698	212.3/212.3	225/225	195/214	703/703	212.3/212.3	225/225	195/214	703/703
			281A00	56.3/75.0	156.4/180.4	256.4/256.4	300/300	250/277	698/698	256.4/256.4	300/300	250/277	698/698	262.4/262.4	300/300	255/283	703/703	262.4/262.4	300/300	255/283	703/703
	460–3–60	STD	NONE	–	–	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
			282A00	25.0	30.1	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
			283A00	50.0	60.1	85.8	90	93	321	85.8	90	93	321	88.6	90	95	323	88.6	90	95	323
			284A00	75.0	90.2	115.9	125	127	321	115.9	125	127	321	118.7	125	130	323	118.7	125	130	323
		MED	NONE	–	–	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
			282A00	25.0	30.1	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
			283A00	50.0	60.1	88.6	90	95	319	88.6	90	95	319	91.3	100	98	321	91.3	100	98	321
			284A00	75.0	90.2	118.7	125	130	319	118.7	125	130	319	121.4	125	132	321	121.4	125	132	321
		HIGH	NONE	–	–	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
			282A00	25.0	30.1	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
			283A00	50.0	60.1	95.7	100	102	359	95.7	100	102	359	98.4	100	104	361	98.4	100	104	361
			284A00	75.0	90.2	125.8	150	136	359	125.8	150	136	359	128.5	150	139	361	128.5	150	139	361
	575–3–60	STD	NONE	–	–	54.5	60	58	243	54.5	60	58	243	56.2	60	60	245	56.2	60	60	245
			285A00	24.8	23.9	54.6	60	58	243	54.6	60	58	243	56.7	60	60	245	56.7	60	60	245
			286A00	49.6	47.7	84.3	90	78	243	84.3	90	78	243	86.5	90	80	245	86.5	90	80	245
			287A00	74.4	71.6	96.3	100	105	243	96.3	100	105	243	98.4	100	107	245	98.4	100	107	245
		MED	NONE	–	–	56.5	70	61	241	56.5	70	61	241	58.2	70	63	243	58.2	70	63	243
			285A00	24.8	23.9	57.1	70	61	241	57.1	70	61	241	59.2	70	63	243	59.2	70	63	243
			286A00	49.6	47.7	86.8	90	80	241	86.8	90	80	241	89.0	90	82	243	89.0	90	82	243
			287A00	74.4	71.6	98.8	100	107	241	98.8	100	107	241	100.9	110	109	243	100.9	110	109	243
		HIGH	NONE	–	–	58.4	70	63	268	58.4	70	63	268	60.1	70	65	270	60.1	70	65	270
			285A00	24.8	23.9	59.5	70	63	268	59.5	70	63	268	61.6	70	65	270	61.6	70	65	270
			286A00	49.6	47.7	89.2	90	82	268	89.2	90	82	268	91.3	100	84	270	91.3	100	84	270
			287A00	74.4	71.6	101.2	110	110	268	101.2	110	110	268	103.3	110	112	270	103.3	110	112	270

See: "Legend and Notes for Tables 8 – 15 on page 49

* Economizer not available for Target units equipped with ERV at this time.

APPENDIX C — ELECTRICAL DATA

Table 14 – 50HC - With Electric Heat, ERV and 2-Speed Indoor Fan Option

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ERV w/o Economizer				w/ERV w/Economizer*				w/ERV w/o Economizer				w/ERV w/Economizer*			
			CRHEATER	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **24	208/230–3–60	STD	NONE	–	–	119.6/118.7	150/150	129/128	583	119.6/118.7	150/150	129/128	583	124.4/123.5	150/150	134/133	588	124.4/123.5	150/150	134/133	588
			279A00	18.8/25.0	52.1/60.1	122.5/131.4	150/150	129/128	583/583	122.5/131.4	150/150	129/128	583/583	128.5/137.4	150/150	134/133	588/588	128.5/137.4	150/150	134/133	588/588
			280A00	37.6/50.0	104.2/120.3	187.7/176.6	200/200	173/190	583/583	187.7/176.6	200/200	173/190	583/583	193.7/182.6	200/200	178/196	588/588	193.7/182.6	200/200	178/196	588/588
			281A00	56.3/75.0	156.4/180.4	213.8/236.7	225/250	233/259	583/583	213.8/236.7	225/250	233/259	583/583	219.8/242.7	225/250	238/265	588/588	219.8/242.7	225/250	238/265	588/588
		MED	NONE	–	–	123.1	150	133	579	123.1	150	133	579	127.9	150	138	584	127.9	150	138	584
			279A00	18.8/25.0	52.1/60.1	126.9/136.9	150/150	133/133	579/579	126.9/136.9	150/150	133/133	579/579	132.9/142.9	150/150	138/138	584/584	132.9/142.9	150/150	138/138	584/584
			280A00	37.6/50.0	104.2/120.3	192.0/182.1	200/200	177/195	579/579	192.0/182.1	200/200	177/195	579/579	198.0/188.1	200/200	182/201	584/584	198.0/188.1	200/200	182/201	584/584
			281A00	56.3/75.0	156.4/180.4	218.2/242.2	225/250	237/264	579/579	218.2/242.2	225/250	237/264	579/579	224.2/248.2	225/250	242/270	584/584	224.2/248.2	225/250	242/270	584/584
		HIGH	NONE	–	–	134.5	150	146	658	134.5	150	146	658	139.3	150	152	663	139.3	150	152	663
			279A00	18.8/25.0	52.1/60.1	141.2/151.2	150/175	146/146	658/658	141.2/151.2	150/175	146/146	658/658	147.2/157.2	150/175	152/152	663/663	147.2/157.2	150/175	152/152	663/663
			280A00	37.6/50.0	104.2/120.3	206.3/196.3	225/200	190/208	658/658	206.3/196.3	225/200	190/208	658/658	212.3/202.3	225/225	195/214	663/663	212.3/202.3	225/225	195/214	663/663
			281A00	56.3/75.0	156.4/180.4	232.4/256.4	250/300	250/277	658/658	232.4/256.4	250/300	250/277	658/658	238.4/262.4	250/300	255/283	663/663	238.4/262.4	250/300	255/283	663/663
	460–3–60	STD	NONE	–	–	61.7	70	66	295	61.7	70	66	295	63.9	80	69	297	63.9	80	69	297
			282A00	25.0	30.1	63.3	70	66	295	63.3	70	66	295	66.1	80	69	297	66.1	80	69	297
			283A00	50.0	60.1	85.8	90	93	295	85.8	90	93	295	88.6	90	95	297	88.6	90	95	297
			284A00	75.0	90.2	115.9	125	127	295	115.9	125	127	295	118.7	125	130	297	118.7	125	130	297
		MED	NONE	–	–	63.9	80	69	293	63.9	80	69	293	66.1	80	71	295	66.1	80	71	295
			282A00	25.0	30.1	66.1	80	69	293	66.1	80	69	293	68.8	80	71	295	68.8	80	71	295
			283A00	50.0	60.1	88.6	90	95	293	88.6	90	95	293	91.3	100	98	295	91.3	100	98	295
			284A00	75.0	90.2	118.7	125	130	293	118.7	125	130	293	121.4	125	132	295	121.4	125	132	295
		HIGH	NONE	–	–	69.6	80	75	333	69.6	80	75	333	71.8	80	78	335	71.8	80	78	335
			282A00	25.0	30.1	73.2	80	75	333	73.2	80	75	333	76.0	80	78	335	76.0	80	78	335
			283A00	50.0	60.1	95.7	100	102	333	95.7	100	102	333	98.4	100	104	335	98.4	100	104	335
			284A00	75.0	90.2	125.8	150	136	333	125.8	150	136	333	128.5	150	139	335	128.5	150	139	335
	575–3–60	STD	NONE	–	–	50.2	60	54	219	50.2	60	54	219	51.9	60	56	221	51.9	60	56	221
			285A00	24.8	23.9	55.3	60	54	219	55.3	60	54	219	57.5	60	56	221	57.5	60	56	221
			286A00	49.6	47.7	85.1	90	78	219	85.1	90	78	219	87.2	90	80	221	87.2	90	80	221
			287A00	74.4	71.6	97.1	100	106	219	97.1	100	106	219	99.2	100	108	221	99.2	100	108	221
		MED	NONE	–	–	51.6	60	56	217	51.6	60	56	217	53.3	60	58	219	53.3	60	58	219
			285A00	24.8	23.9	57.1	60	56	217	57.1	60	56	217	59.2	60	58	219	59.2	60	58	219
			286A00	49.6	47.7	86.8	90	80	217	86.8	90	80	217	89.0	90	82	219	89.0	90	82	219
			287A00	74.4	71.6	98.8	100	107	217	98.8	100	107	217	100.9	110	109	219	100.9	110	109	219
		HIGH	NONE	–	–	53.5	60	58	244	53.5	60	58	244	55.2	60	60	246	55.2	60	60	246
			285A00	24.8	23.9	59.5	60	58	244	59.5	60	58	244	61.6	70	60	246	61.6	70	60	246
			286A00	49.6	47.7	89.2	90	82	244	89.2	90	82	244	91.3	100	84	246	91.3	100	84	246
			287A00	74.4	71.6	101.2	110	110	244	101.2	110	110	244	103.3	110	112	246	103.3	110	112	246

See: "Legend and Notes for Tables 8 – 15 on page 49

* Economizer not available for Target units equipped with ERV at this time.

EnergyX

APPENDIX C — ELECTRICAL DATA

Table 14 - 50HC - With Electric Heat, ERV and 2-Speed Indoor Fan Option (cont.)

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ERV w/o Economizer				w/ERV w/Economizer*				w/ERV w/o Economizer				w/ERV w/Economizer*			
			CRHEATER	Nom (kW)	FLA	MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE		MCA	MAX FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **28	208/230–3–60	STD	NONE	–	–	148.3/147.4	175/175	157/156	623	148.3/147.4	175/175	157/156	623	153.1/152.2	200/200	162/161	628	153.1/152.2	200/200	162/161	628
			279A00	18.8/25.0	52.1/60.1	148.3/147.4	175/175	157/156	623/623	148.3/147.4	175/175	157/156	623/623	153.1/152.2	200/200	162/161	628/628	153.1/152.2	200/200	162/161	628/628
			280A00	37.6/50.0	104.2/120.3	187.7/176.6	200/200	173/190	623/623	187.7/176.6	200/200	173/190	623/623	193.7/182.6	200/200	178/196	628/628	193.7/182.6	200/200	178/196	628/628
			281A00	56.3/75.0	156.4/180.4	213.8/236.7	225/250	233/259	623/623	213.8/236.7	225/250	233/259	623/623	219.8/242.7	225/250	238/265	628/628	219.8/242.7	225/250	238/265	628/628
		MED	NONE	–	–	151.8	175	161	619	151.8	175	161	619	156.6	200	166	624	156.6	200	166	624
			279A00	18.8/25.0	52.1/60.1	151.8/151.8	175/175	161/161	619/619	151.8/151.8	175/175	161/161	619/619	156.6/156.6	200/200	166/166	624/624	156.6/156.6	200/200	166/166	624/624
			280A00	37.6/50.0	104.2/120.3	192.0/182.1	200/200	177/195	619/619	192.0/182.1	200/200	177/195	619/619	198.0/188.1	200/200	182/201	624/624	198.0/188.1	200/200	182/201	624/624
			281A00	56.3/75.0	156.4/180.4	218.2/242.2	225/250	237/264	619/619	218.2/242.2	225/250	237/264	619/619	224.2/248.2	225/250	242/270	624/624	224.2/248.2	225/250	242/270	624/624
		HIGH	NONE	–	–	163.2	200	174	698	163.2	200	174	698	168.0	200	179	703	168.0	200	179	703
			279A00	18.8/25.0	52.1/60.1	163.2/163.2	200/200	174/174	698/698	163.2/163.2	200/200	174/174	698/698	168.0/168.0	200/200	179/179	703/703	168.0/168.0	200/200	179/179	703/703
			280A00	37.6/50.0	104.2/120.3	206.3/196.3	225/200	190/208	698/698	206.3/196.3	225/200	190/208	698/698	212.3/202.3	225/225	195/214	703/703	212.3/202.3	225/225	195/214	703/703
			281A00	56.3/75.0	156.4/180.4	232.4/256.4	250/300	250/277	698/698	232.4/256.4	250/300	250/277	698/698	238.4/262.4	250/300	255/283	703/703	238.4/262.4	250/300	255/283	703/703
	460–3–60	STD	NONE	–	–	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
			282A00	25.0	30.1	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
			283A00	50.0	60.1	85.8	90	93	321	85.8	90	93	321	88.6	90	95	323	88.6	90	95	323
			284A00	75.0	90.2	115.9	125	127	321	115.9	125	127	321	118.7	125	130	323	118.7	125	130	323
		MED	NONE	–	–	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
			282A00	25.0	30.1	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
			283A00	50.0	60.1	88.6	90	95	319	88.6	90	95	319	91.3	100	98	321	91.3	100	98	321
			284A00	75.0	90.2	118.7	125	130	319	118.7	125	130	319	121.4	125	132	321	121.4	125	132	321
		HIGH	NONE	–	–	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
			282A00	25.0	30.1	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
			283A00	50.0	60.1	95.7	100	102	359	95.7	100	102	359	98.4	100	104	361	98.4	100	104	361
			284A00	75.0	90.2	125.8	150	136	359	125.8	150	136	359	128.5	150	139	361	128.5	150	139	361
	575–3–60	STD	NONE	–	–	55.1	60	59	243	55.1	60	59	243	56.8	70	61	245	56.8	70	61	245
			285A00	24.8	23.9	55.3	60	59	243	55.3	60	59	243	57.5	70	61	245	57.5	70	61	245
			286A00	49.6	47.7	85.1	90	78	243	85.1	90	78	243	87.2	90	80	245	87.2	90	80	245
			287A00	74.4	71.6	97.1	100	106	243	97.1	100	106	243	99.2	100	108	245	99.2	100	108	245
		MED	NONE	–	–	56.5	70	61	241	56.5	70	61	241	58.2	70	63	243	58.2	70	63	243
			285A00	24.8	23.9	57.1	70	61	241	57.1	70	61	241	59.2	70	63	243	59.2	70	63	243
			286A00	49.6	47.7	86.8	90	80	241	86.8	90	80	241	89.0	90	82	243	89.0	90	82	243
			287A00	74.4	71.6	98.8	100	107	241	98.8	100	107	241	100.9	110	109	243	100.9	110	109	243
		HIGH	NONE	–	–	58.4	70	63	268	58.4	70	63	268	60.1	70	65	270	60.1	70	65	270
			285A00	24.8	23.9	59.5	70	63	268	59.5	70	63	268	61.6	70	65	270	61.6	70	65	270
			286A00	49.6	47.7	89.2	90	82	268	89.2	90	82	268	91.3	100	84	270	91.3	100	84	270
			287A00	74.4	71.6	101.2	110	110	268	101.2	110	110	268	103.3	110	112	270	103.3	110	112	270

See: "Legend and Notes for Tables 8 – 15 on page 49

* Economizer not available for Target units equipped with ERV at this time.

APPENDIX C — ELECTRICAL DATA

Table 15 – 50HC - With Electric Heat, ERV, Factory-installed Factory-Installed HACR Breaker and 2-Speed Indoor Fan Option

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ERV w/o Economizer				w/ERV w/Economizer*				w/ERV w/o Economizer				w/ERV w/Economizer*			
			CRHEATER	Nom (kW)	FLA	MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **24	208/230–3–60	STD	NONE	–	–	119.6/119.6	150/150	129/128	583	119.6/119.6	150/150	129/128	583	124.4/124.4	150/150	134/133	588	124.4/124.4	150/150	134/133	588
			279A00	18.8/25.0	52.1/60.1	131.4/131.4	150/150	129/128	583/583	131.4/131.4	150/150	129/128	583/583	137.4/137.4	150/150	134/133	588/588	137.4/137.4	150/150	134/133	588/588
			280A00	37.6/50.0	104.2/120.3	187.7/187.7	200/200	173/190	583/583	187.7/187.7	200/200	173/190	583/583	193.7/193.7	200/200	178/196	588/588	193.7/193.7	200/200	178/196	588/588
			281A00	56.3/75.0	156.4/180.4	236.7/236.7	250/250	233/259	583/583	236.7/236.7	250/250	233/259	583/583	242.7/242.7	250/250	238/265	588/588	242.7/242.7	250/250	238/265	588/588
		MED	NONE	–	–	123.1	150	133	579	123.1	150	133	579	127.9	150	138	584	127.9	150	138	584
			279A00	18.8/25.0	52.1/60.1	136.9/136.9	150/150	133/133	579/579	136.9/136.9	150/150	133/133	579/579	142.9/142.9	150/150	138/138	584/584	142.9/142.9	150/150	138/138	584/584
			280A00	37.6/50.0	104.2/120.3	192.0/192.0	200/200	177/195	579/579	192.0/192.0	200/200	177/195	579/579	198.0/198.0	200/200	182/201	584/584	198.0/198.0	200/200	182/201	584/584
			281A00	56.3/75.0	156.4/180.4	242.2/242.2	250/250	237/264	579/579	242.2/242.2	250/250	237/264	579/579	248.2/248.2	250/250	242/270	584/584	248.2/248.2	250/250	242/270	584/584
		HIGH	NONE	–	–	134.5	150	146	658	134.5	150	146	658	139.3	150	152	663	139.3	150	152	663
			279A00	18.8/25.0	52.1/60.1	151.2/151.2	175/175	146/146	658/658	151.2/151.2	175/175	146/146	658/658	157.2/157.2	175/175	152/152	663/663	157.2/157.2	175/175	152/152	663/663
			280A00	37.6/50.0	104.2/120.3	206.3/206.3	225/225	190/208	658/658	206.3/206.3	225/225	190/208	658/658	212.3/212.3	225/225	195/214	663/663	212.3/212.3	225/225	195/214	663/663
			281A00	56.3/75.0	156.4/180.4	256.4/256.4	300/300	250/277	658/658	256.4/256.4	300/300	250/277	658/658	262.4/262.4	300/300	255/283	663/663	262.4/262.4	300/300	255/283	663/663
	460–3–60	STD	NONE	–	–	61.7	70	66	295	61.7	70	66	295	63.9	80	69	297	63.9	80	69	297
			282A00	25.0	30.1	63.3	70	66	295	63.3	70	66	295	66.1	80	69	297	66.1	80	69	297
			283A00	50.0	60.1	85.8	90	93	295	85.8	90	93	295	88.6	90	95	297	88.6	90	95	297
			284A00	75.0	90.2	115.9	125	127	295	115.9	125	127	295	118.7	125	130	297	118.7	125	130	297
		MED	NONE	–	–	63.9	80	69	293	63.9	80	69	293	66.1	80	71	295	66.1	80	71	295
			282A00	25.0	30.1	66.1	80	69	293	66.1	80	69	293	68.8	80	71	295	68.8	80	71	295
			283A00	50.0	60.1	88.6	90	95	293	88.6	90	95	293	91.3	100	98	295	91.3	100	98	295
			284A00	75.0	90.2	118.7	125	130	293	118.7	125	130	293	121.4	125	132	295	121.4	125	132	295
		HIGH	NONE	–	–	69.6	80	75	333	69.6	80	75	333	71.8	80	78	335	71.8	80	78	335
			282A00	25.0	30.1	73.2	80	75	333	73.2	80	75	333	76.0	80	78	335	76.0	80	78	335
			283A00	50.0	60.1	95.7	100	102	333	95.7	100	102	333	98.4	100	104	335	98.4	100	104	335
			284A00	75.0	90.2	125.8	150	136	333	125.8	150	136	333	128.5	150	139	335	128.5	150	139	335
	575–3–60	STD	NONE	–	–	50.2	60	54	219	50.2	60	54	219	51.9	60	56	221	51.9	60	56	221
			285A00	24.8	23.9	55.3	60	54	219	55.3	60	54	219	57.5	60	56	221	57.5	60	56	221
			286A00	49.6	47.7	85.1	90	78	219	85.1	90	78	219	87.2	90	80	221	87.2	90	80	221
			287A00	74.4	71.6	97.1	100	106	219	97.1	100	106	219	99.2	100	108	221	99.2	100	108	221
		MED	NONE	–	–	51.6	60	56	217	51.6	60	56	217	53.3	60	58	219	53.3	60	58	219
			285A00	24.8	23.9	57.1	60	56	217	57.1	60	56	217	59.2	60	58	219	59.2	60	58	219
			286A00	49.6	47.7	86.8	90	80	217	86.8	90	80	217	89.0	90	82	219	89.0	90	82	219
			287A00	74.4	71.6	98.8	100	107	217	98.8	100	107	217	100.9	110	109	219	100.9	110	109	219
		HIGH	NONE	–	–	53.5	60	58	244	53.5	60	58	244	55.2	60	60	246	55.2	60	60	246
			285A00	24.8	23.9	59.5	60	58	244	59.5	60	58	244	61.6	70	60	246	61.6	70	60	246
			286A00	49.6	47.7	89.2	90	82	244	89.2	90	82	244	91.3	100	84	246	91.3	100	84	246
			287A00	74.4	71.6	101.2	110	110	244	101.2	110	110	244	103.3	110	112	246	103.3	110	112	246

See: "Legend and Notes for Tables 8 – 15 on page 49

* Economizer not available for Target units equipped with ERV at this time.

EnergyX

APPENDIX C — ELECTRICAL DATA

Table 15 - 50HC - With Electric Heat, ERV, Factory-installed Factory-Installed HACR Breaker and 2-Speed Indoor Fan Option (cont.)

UNIT	NOM. V–Ph–Hz	IFM TYPE	ELEC. HTR			NO C.O. or UNPWR C.O.								w/ PWRD C.O.							
						w/ERV w/o Economizer				w/ERV w/Economizer*				w/ERV w/o Economizer				w/ERV w/Economizer*			
			CRHEATER	Nom (kW)	FLA	MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE		MCA	HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA			FLA	LRA			FLA	LRA
50HC **28	208/230–3–60	STD	NONE	–	–	148.3/148.3	175/175	157/156	623	148.3/148.3	175/175	157/156	623	153.1/153.1	200/200	162/161	628	153.1/153.1	200/200	162/161	628
			279A00	18.8/25.0	52.1/60.1	148.3/148.3	175/175	157/156	623/623	148.3/148.3	175/175	157/156	623/623	153.1/153.1	200/200	162/161	628/628	153.1/153.1	200/200	162/161	628/628
			280A00	37.6/50.0	104.2/120.3	187.7/187.7	200/200	173/190	623/623	187.7/187.7	200/200	173/190	623/623	193.7/193.7	200/200	178/196	628/628	193.7/193.7	200/200	178/196	628/628
			281A00	56.3/75.0	156.4/180.4	236.7/236.7	250/250	233/259	623/623	236.7/236.7	250/250	233/259	623/623	242.7/242.7	250/250	238/265	628/628	242.7/242.7	250/250	238/265	628/628
		MED	NONE	–	–	151.8	175	161	619	151.8	175	161	619	156.6	200	166	624	156.6	200	166	624
			279A00	18.8/25.0	52.1/60.1	151.8/151.8	175/175	161/161	619/619	151.8/151.8	175/175	161/161	619/619	156.6/156.6	200/200	166/166	624/624	156.6/156.6	200/200	166/166	624/624
			280A00	37.6/50.0	104.2/120.3	192.0/192.0	200/200	177/195	619/619	192.0/192.0	200/200	177/195	619/619	198.0/198.0	200/200	182/201	624/624	198.0/198.0	200/200	182/201	624/624
			281A00	56.3/75.0	156.4/180.4	242.2/242.2	250/250	237/264	619/619	242.2/242.2	250/250	237/264	619/619	248.2/248.2	250/250	242/270	624/624	248.2/248.2	250/250	242/270	624/624
		HIGH	NONE	–	–	163.2	200	174	698	163.2	200	174	698	168.0	200	179	703	168.0	200	179	703
			279A00	18.8/25.0	52.1/60.1	163.2/163.2	200/200	174/174	698/698	163.2/163.2	200/200	174/174	698/698	168.0/168.0	200/200	179/179	703/703	168.0/168.0	200/200	179/179	703/703
			280A00	37.6/50.0	104.2/120.3	206.3/206.3	225/225	190/208	698/698	206.3/206.3	225/225	190/208	698/698	212.3/212.3	225/225	195/214	703/703	212.3/212.3	225/225	195/214	703/703
			281A00	56.3/75.0	156.4/180.4	256.4/256.4	300/300	250/277	698/698	256.4/256.4	300/300	250/277	698/698	262.4/262.4	300/300	255/283	703/703	262.4/262.4	300/300	255/283	703/703
	460–3–60	STD	NONE	–	–	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
			282A00	25.0	30.1	67.1	80	72	321	67.1	80	72	321	69.3	80	74	323	69.3	80	74	323
			283A00	50.0	60.1	85.8	90	93	321	85.8	90	93	321	88.6	90	95	323	88.6	90	95	323
			284A00	75.0	90.2	115.9	125	127	321	115.9	125	127	321	118.7	125	130	323	118.7	125	130	323
		MED	NONE	–	–	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
			282A00	25.0	30.1	69.3	80	74	319	69.3	80	74	319	71.5	90	77	321	71.5	90	77	321
			283A00	50.0	60.1	88.6	90	95	319	88.6	90	95	319	91.3	100	98	321	91.3	100	98	321
			284A00	75.0	90.2	118.7	125	130	319	118.7	125	130	319	121.4	125	132	321	121.4	125	132	321
		HIGH	NONE	–	–	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
			282A00	25.0	30.1	75.0	90	81	359	75.0	90	81	359	77.2	90	83	361	77.2	90	83	361
			283A00	50.0	60.1	95.7	100	102	359	95.7	100	102	359	98.4	100	104	361	98.4	100	104	361
			284A00	75.0	90.2	125.8	150	136	359	125.8	150	136	359	128.5	150	139	361	128.5	150	139	361
	575–3–60	STD	NONE	–	–	55.1	60	59	243	55.1	60	59	243	56.8	70	61	245	56.8	70	61	245
			285A00	24.8	23.9	55.3	60	59	243	55.3	60	59	243	57.5	70	61	245	57.5	70	61	245
			286A00	49.6	47.7	85.1	90	78	243	85.1	90	78	243	87.2	90	80	245	87.2	90	80	245
			287A00	74.4	71.6	97.1	100	106	243	97.1	100	106	243	99.2	100	108	245	99.2	100	108	245
		MED	NONE	–	–	56.5	70	61	241	56.5	70	61	241	58.2	70	63	243	58.2	70	63	243
			285A00	24.8	23.9	57.1	70	61	241	57.1	70	61	241	59.2	70	63	243	59.2	70	63	243
			286A00	49.6	47.7	86.8	90	80	241	86.8	90	80	241	89.0	90	82	243	89.0	90	82	243
			287A00	74.4	71.6	98.8	100	107	241	98.8	100	107	241	100.9	110	109	243	100.9	110	109	243
		HIGH	NONE	–	–	58.4	70	63	268	58.4	70	63	268	60.1	70	65	270	60.1	70	65	270
			285A00	24.8	23.9	59.5	70	63	268	59.5	70	63	268	61.6	70	65	270	61.6	70	65	270
			286A00	49.6	47.7	89.2	90	82	268	89.2	90	82	268	91.3	100	84	270	91.3	100	84	270
			287A00	74.4	71.6	101.2	110	110	268	101.2	110	110	268	103.3	110	112	270	103.3	110	112	270

See: “Legend and Notes for Tables 8 – 15 on page 49

* Economizer not available for Target units equipped with ERV at this time

Legend and Notes for Tables 8 - 15

LEGEND:

BRKR	–	Circuit breaker
CO	–	Convenient outlet
DD	–	Direct drive indoor fan motor
DISC	–	Disconnect
FLA	–	Full load amps
LRA	–	Locked rotor amps
MCA	–	Minimum circuit amps
MOCP	–	MAX FUSE or HACR Breaker
PWRD CO	–	Powered convenient outlet
UNPWR CO	–	Unpowered convenient outlet

NOTES:

1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percentage of voltage imbalance.

$$\text{\% Voltage Imbalance} = 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 230-3-60

AB = 224 v
BC = 231 v
AC = 226 v

$$\text{Average Voltage} = \frac{(224 + 231 + 226)}{3} = \frac{681}{3}$$

$$= 227$$

Determine maximum deviation from average voltage.
(AB) 227 – 224 = 3 v
(BC) 231 – 227 = 4 v
(AC) 227 – 226 = 1 v
Maximum deviation is 4 v.
Determine percent of voltage imbalance.

$$\text{\% Voltage Imbalance} = 100 \times \frac{4}{227}$$

$$= 1.76\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

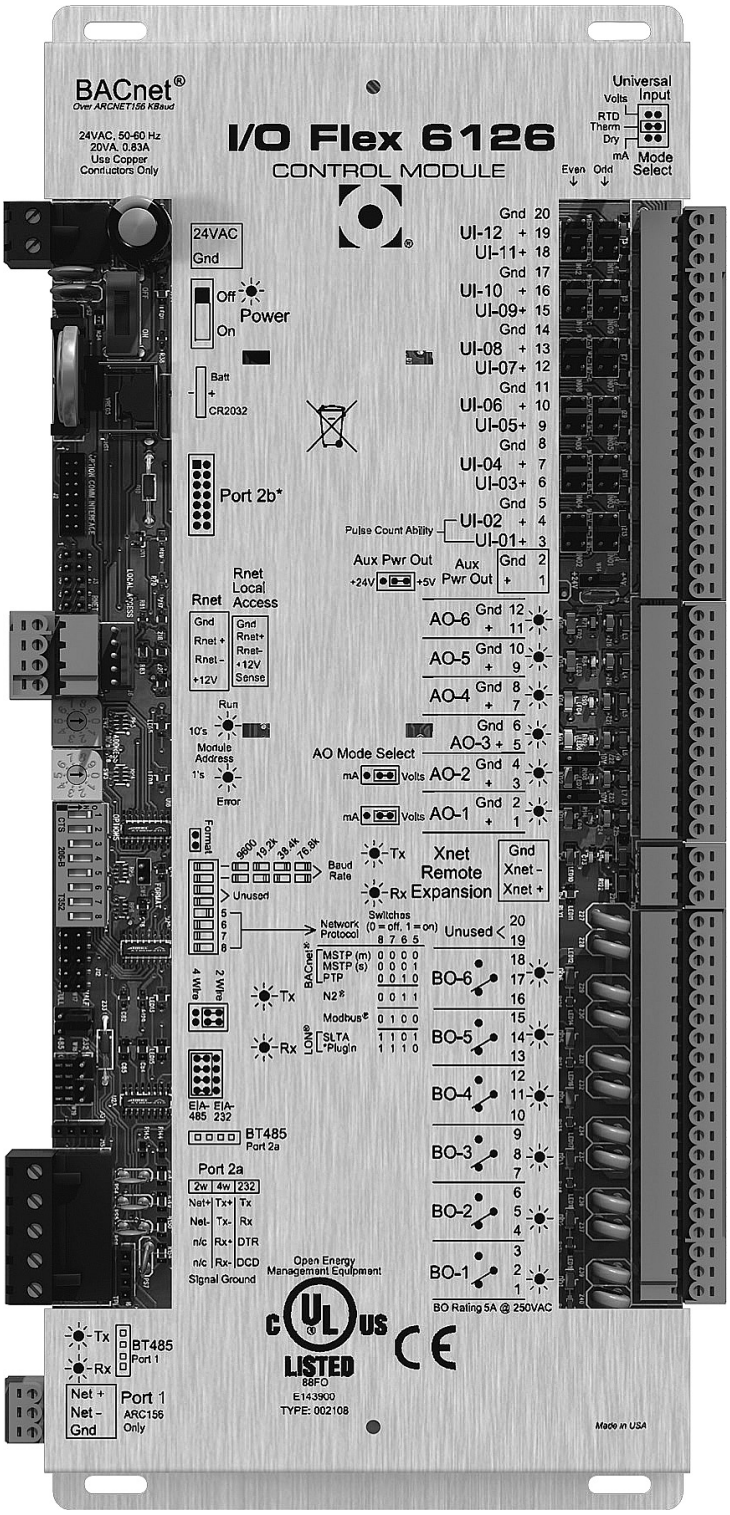
APPENDIX D — I/O FLEX 6126 CONTROLLER

General

This appendix details the installation and configuration of the I/O Flex 6126 into the Building Automation System (BAS).

The I/O Flex 6126 is a general purpose controller. It provides the communications circuity, non-volatile memory, and removable screw terminals for I/O connections.

The I/O Flex 6126 controller is factory-mounted in the 48/50HC unit's main control box, to the left of the CTB (central terminal board). See Figs. 32 and 33 for location of the I/O Flex 6126 control.



C12787

Fig. 31 - I/O Flex 6126 Controller

Specifications

Driver	drv_ioflex
Maximum number of control programs*	20
Maximum Number of BACnet objects*	1000
* Depends on available memory	
Power	24 Vac ±10%, 50–60 Hz 20 VA power consumption (26 VA with BACview attached) 26 Vdc (25 V min, 30 V max) Single Class 2 source only, 100 VA or less
Comm Ports	**Port 1:** For communication with ARC156 networks **Port 2a:** For communication on EIA–232 or EIA–485 (2–wire or 4–wire). Network protocol selectable for: • BACnet (MS/TP or PTP) • Modbus • N2 • LonWorks SLTA **Port 2b:** For LonWorks Option Card
Rnet port	For connecting to RS sensors and/or BACview. Supports any of the following: • 1 RS Plus, RS Pro, or RS Pro–F • 1–4 RS Standards • 1–4 RS Standards, and 1 RS Plus, RS Pro, or RS Pro–F Any of the above combinations, plus up to 2 BACview, but no more than 6 devices total.
Local Access port	For local communication with a laptop computer running WebCTRL or for communications with a BACview[6].
Universal inputs	12 inputs configurable for 0–10 V, RTD Therm Dry, or 0–20mA. Inputs 1 and 2 may bye used for pulse counting.
Input pulse frequency	Maximum of 10 pulses per second. Minimum pulse width required for each pulse: • ON to OFF time (half cycle) is 50 msec • ON to OFF to ON time (full cycle) is 100 msec
Input resolution	12 bit A/D
Binary outputs	6 binary outputs, relay contacts rated at 5A max @ 250 Vac. Configured normally open or normally closed.
Analog outputs	6 analog outputs, Inputs 1 and 2 are configurable for 0–10 V or 0–20nA, 3 – 6 are 0–10 V only.
Output resolution	8 bit D/A
Memory	1 MB non-volatile battery-backed RAM, 1 MB Flash memory, 16-bit memory bus
Real–time clock	Battery–backed real–time clock keeps track of time in event of power failure
Battery	10-year Lithium CR2032 battery provides a minimum of 10,000 hours of data retention during power outages
Protection	Incoming power and network connections – non-replaceable internal solid-state polyswitches reset themselves when fault clears Power, network, I/O connections – protected against voltage transient and surge events
Status indicators	LEDs indicate status of communications, running, errors, and power. LED indicators for transmit/receive for Port 1 and Port 2a and for each of the 12 outputs.
Environmental operating range	–20° to 140°F (–29° to 60°C), 10–95% relative humidity, non-condensing
Physical	Rugged aluminum housing with removable screw terminals
Overall dimensions (H x W x D)	$11\,^{13}/_{16}$ in. (30 cm) x 5 in. (12.7 cm) x $1\,^{9}/_{16}$ in. (4 cm)
Weight	1.1 lb. (0.5 kg)
BACnet Support	Conforms to Advanced Applications Controller (B–AAC) Standard Device Profile as defined in ANSI/ASHRAE Standard 135–2004 (BACnet) Annex L
Listed by	UL916 (Canadian Std C22.2 No. 205–m1983, CE, FCC Part 15 – Subpart B – Class A

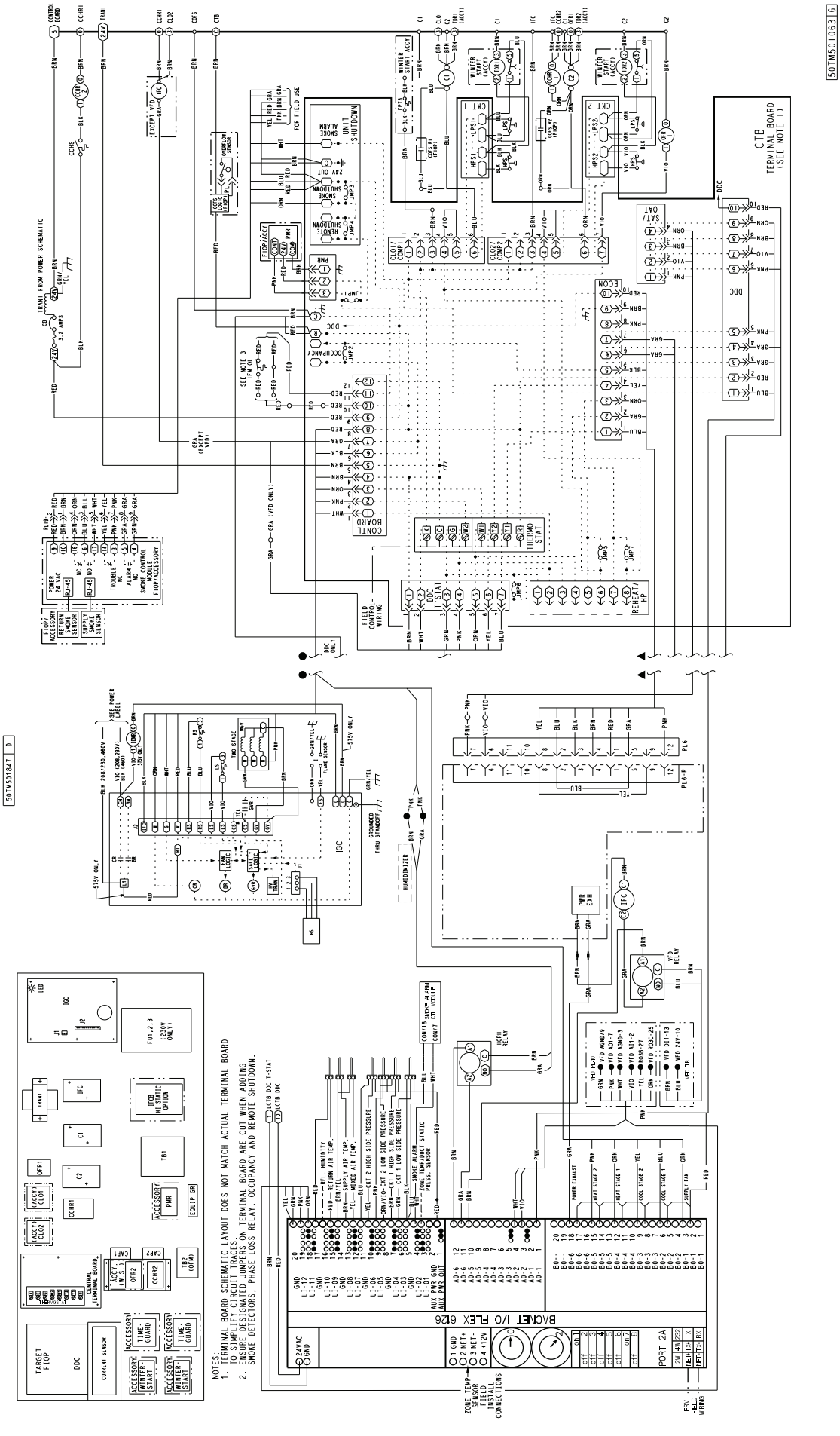
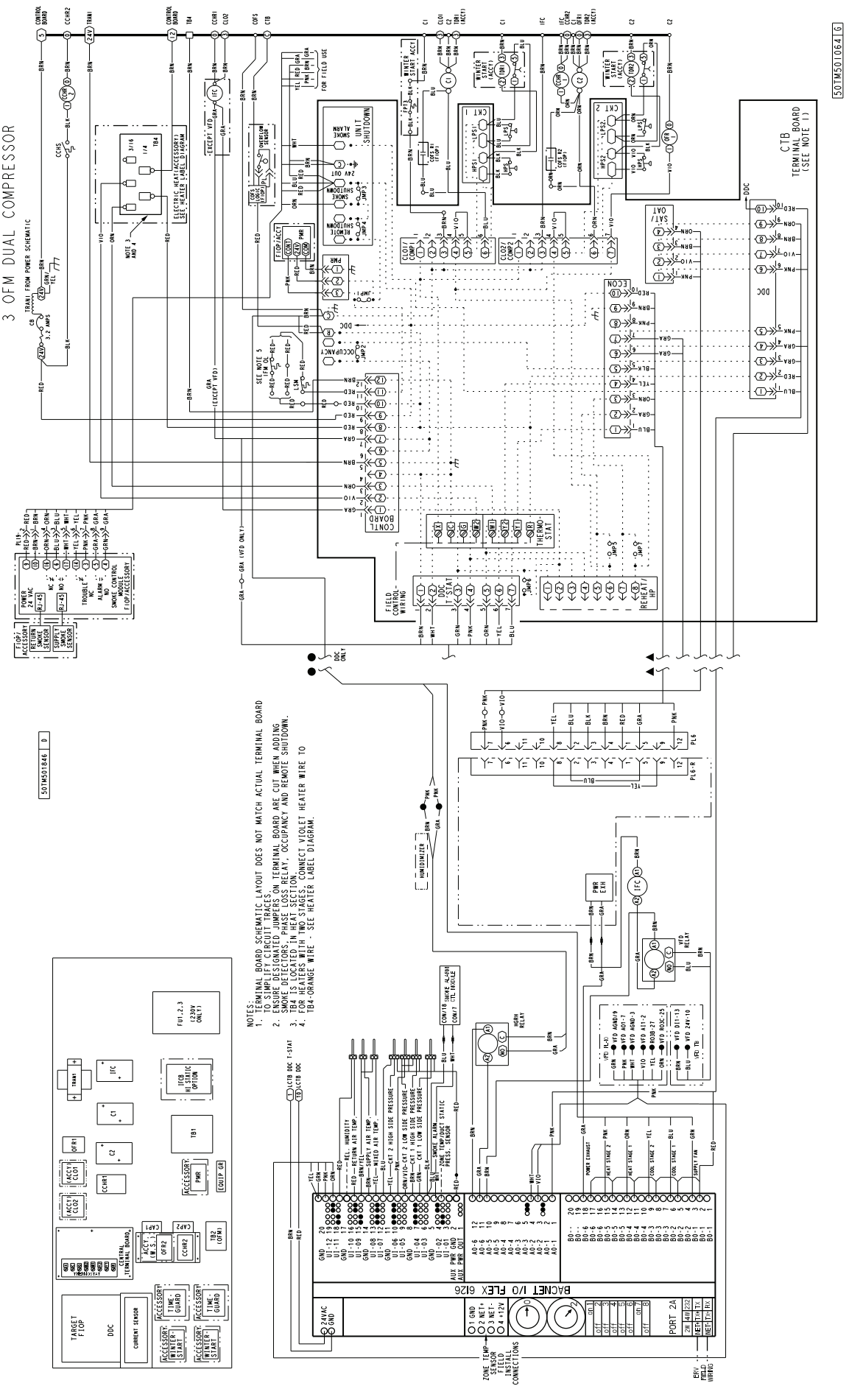

MID TIER YAC CONTROL 208/230V,460V,575V
3 OFM DUAL COMPRESSOR
50TM501847 0
50TM501063 G
NOTES:
1. TERMINAL BOARD SCHEMATIC LAYOUT DOES NOT MATCH ACTUAL TERMINAL BOARD TO SIMPLIFY CIRCUIT TRACES.
2. FIELD INSTALLED JUMPERS ON TERMINAL BOARD ARE CUT WHEN ADDING SMOKE DETECTORS, PHASE LOSS RELAY, OCCUPANCY AND REMOTE SHUTDOWN.
BACNET I/O FLEX 6126
PORT 2A
CTB TERMINAL BOARD (SEE NOTE 1)
IGC
DDC
ECON
SAT/OAT
TARGET FIOP
CURRENT SENSOR
ZONE TEMP SENSOR FIELD INSTALL CONNECTIONS
FIELD WIRING
C12788

Fig. 32 - Wiring Diagram - 48HCD*24/28 with I/O Flex 6126 Controller



C12789

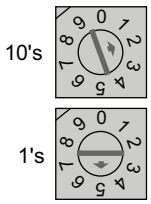
Fig. 33 - Wiring Diagram - 50HC*24/28 with I/O Flex 6126 Controller

To Address the I/O Flex 6126 —

The I/O Flex 6126's two rotary switches determine the I/O Flex 6126's MAC address when it is place on the BACnet/ARC156 or BACnet MS/TP network. The rotary switches define the MAC address portion of the device's BACnet address, which is composed of the network address and the MAC address. They also set the slave address on a Modbus or N2 network, when less than 100.

1. If the I/O Flex 6126 has been wired for power, pull the screw terminal connector from its power terminals labeled **Gnd** and **Hot**. The controller reads the address each time you apply power to it.
2. Using the rotary switches, set the controller's address. Set the **Tens** (**10's**) switch to the tens digit of the address, and set the **Ones** (**1's**) switch to the ones digit.

   EXAMPLE: If the controller's address is 25, point the arrow on the **Tens** (**10's**) switch to 2 and the arrow on the **Ones** (**1's**) switch to 5. See the figure below



C12790

NOTE: The I/O Flex 6126 recognizes its address only after power has been cycled.

To Wire for Power —

⚠ CAUTION

EQUIPMENT PERFORMANCE HAZARD

Failure to follow this caution may cause equipment to not work properly.

- The I/O Flex 6126 has an operating range of 21.6 Vac to 26.4 Vac. If voltage measured at the I/O Flex 6126's input terminals is outside of this range, the I/O Flex 6126 may not work properly.
- Do not power pilot relays from the same transformer that powers the I/O Flex 6126.

1. Turn off the I/O Flex 6126's power to prevent it from powering up before you can verify the correct voltage.
2. Remove power from the 24 Vac transformer
3. Pull the screw terminal connector from the controller's power terminals labeled Gnd and 24 Vac.
4. Connect the transformer wires to the screw terminal connector.
5. Apply power to the transformer.
6. Measure the voltage at the I/O Flex 6126's power input terminals to verify that the voltage is within the operating range of 21.6 - 26.4 Vac.
7. Insert the screw terminal connector into the I/O Flex 6126's power terminals.
8. Turn on the I/O Flex 6126's power.
9. Verify that the Power LED is on and the Run LED is blinking.

Wiring Inputs and Outputs

Input Wiring Specifications

Input	Maximum Length	Minimum Gauge	Shielding
0–5 Vdc	1000 feet (305 meters)	26 AWG	Shielded
0–20 mA	3000 feet (914 meters)	26 AWG	Shielded or Unshielded
Thermistor Dry Contact Pulse Counter TLO	1000 feet (305 meters)	22 AWG	Shielded
RTD	100 feet (30 meters)	22 AWG	Shielded
RS Sensor	500 feet (152 meters)	19 AWG, 4 conductor if a BACview is connected to the Rnet 22 AWG, 4 conductor if only RS room sensors are connected	Shielded or Unshielded

Inputs

The I/O Flex 6126 has 12 inputs that accept the signal types described below.

These Inputs…	Support this signal type…	Description
All	Thermistor RTD 0–20 mA 0–10 Vdc	Precon type 2 (10 kOhm at 77F). Input voltages should be from 0.489 Vdc to 3.825 Vdc for thermistors. The input impedance of the I/O Flex 6126 is approximately 1 Mohm.
All	Dry Contact	A 5 Vdc wetting voltage detects contact position, resulting in a 0.5 mA maximum sense current when the contacts are closed.
UI–1, UI–2	Pulse Input	Maximum of 10 pulses per second. Minimum pulse width required for each pulse: • ON to OFF time (half cycle) is 50 msec • ON to OFF to ON time (full cycle) is 100 msec

Local Access

To Communicate Through the Local Access Port

Use a computer and a USB Link Kit to communicate locally with the I/O Flex 6126 to download or to troubleshoot.

Prerequisites

- A computer with a USB port
- A USB Link Kit

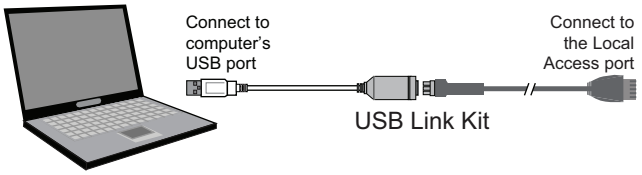
⚠ CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may cause equipment damage.

- Failure to maintain polarity while using the USB Link on a computer that is grounded via its AC adapter may damage the USB Link and the I/O Flex 6126 controller.
- If wary of the integrity of electrical work, and the computer is running on AC power use a USB isolator (secured through a third-party manufacturer). First plug the USB isolator into the computer's USB port, then connect the USB Link to the isolator.

1. If using the USB Link Kit with your computer for the first time, install the USB Link Kit's driver before connecting the cable to the computer.
   a. Put the USB Link Driver CD or WebCTRL install DVD into the computer.
   b. Install the USB Link Driver, accepting all of the wizard's default settings.
2. Connect the USB Link Kit to the computer and to the I/O Flex 6126 controller's Local Access port.



C12795

Rnet Wiring Specifications

NOTE: Use the specified type of wire and cable for maximum signal integrity.

Description	4 conductor, shielded or unshielded, CMP, plenum rated cable
Conductor	22 AWG (7x0096) bare copper if Rnet has only RS sensors. 18 AWG (7x0152) bare copper if Rnet has a BACview.
Maximum length	500 feet (152 meters)
Insulation	Low–smoke PVC (or equivalent)
Color Code	Black, White, Green, Red
Shielding	If shielded, Aluminum/Mylar shield (100% coverage) with TC drain wire
UL temperature rating	32–167°F (0–75°C)
Voltage	300 Vac, power limited
Listing	UL: NEC CL2P, or better

Wiring an RS Room Sensor to the I/O Flex 6126

The I/O Flex 6126 supports up to 5 RS sensors on its BACview/RS sensor port.

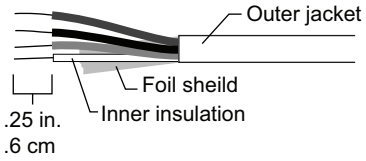
RS sensors can be wired to the I/O Flex 6126's Rnet port in any of the following combinations:

- 1 RS Plus, RS Prow, or RS Pro-F
- 1–4 RS Standards
- 1–4 RS Standards, and 1 RS Plus, RS Pro*, or RS Pro-F

* The RS Pro is a thermistor-based temperature sensor.

To Wire an RS Room Sensor —

1. Turn off the I/O Flex 6126's power.
2. Pull the screw terminal connector from the RS sensor.
3. Pull the screw terminal connector from the Rnet port.
4. Partially cut, then bend and pull off the outer jacket of the Rnet cable(s). Do not nick the inner insulation.

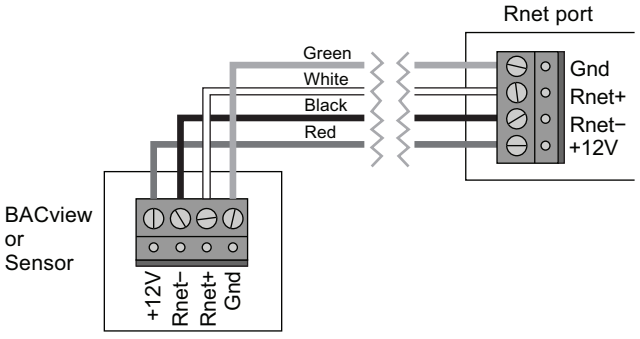


C12796

5. Strip about .25 inch (.6 cm) of the inner insulation from each wire.
6. Wire each terminal on the I/O Flex 6126's Rnet port to the terminal of the same name on the RS room sensor.

NOTES:

- If using shielded wire, connect the shield wire and the ground wire to the Gnd terminal.
- Maintain same polarity.



C12797

7. Turn on the I/O Flex 6126's power.

Troubleshooting

If you have problems wiring or addressing the I/O Flex 6126, contact OEMCtrl Technical Support.

Communication LED's

The LED's indicate if the I/O Flex 6126 controller is speaking to the devices on the network. The LED's should reflect communication traffic based on the baud rate set. The higher the baud rate the more solid the LED's become.

LED	Status
	Lights when power is being supplied to the controller. **NOTE**: The I/O Flex 6126 is protected by internal solid state Polyswitches on the incoming power and network connections. These Polyswitches are not replaceable and will reset themselves if the condition that caused the fault returns to normal.
Rx	Lights when the controller receives data from the network segment; there is a Rx LED for Ports 1 and 2.
Tx	Lights when the controller transmits data to the network segment; there is a Tx LED for Ports 1 and 2.
Run	Lights based on the controllers health. See table below.
Error	Lights based on the controllers health. See table below.

The **Run** and **Error** LED's indicate controller and network status.

If Run LED shows…	And Error LED shows…	Status is…
1 flash per second	1 flash per second, alternating with the Run LED	The controller files are archiving. Archive is complete when **Error** LED stops flashing
2 flashes per second	Off	Normal
2 flashes per second	2 flashes, alternating with **Run** LED	Five minute auto–restart delay after system error
2 flashes per second	3 flashes, then off	The controller has just been formatted
2 flashes per second	On	Two or more devices on this network have the same MS/TP network address
2 flashes per second	1 flash per second	The controller is alone on the network
2 flashes per second	On	Exec halted after frequent system errors, due to: • Controller halted • Program memory corrupted • Address conflicts – duplicate MS/TP MAC addresses • One or more programs stopped
5 flashes per second	On	Exec start–up aborted, Boot is running
5 flashes per second	Off	Firmware transfer in progress, Boot is running
7 flashes per second	7 flashes per second, alternating with **Run** LED	Ten second recovery period after brownout
14 flashes per second	14 flashes per second, alternating with **Run** LED	Brownout
On	On	Failure, Try the following solutions: • Turn the I/O Flex 6126 off, then on. • Download memory to the I/O Flex 6126. • Replace the I/O Flex 6126.

Serial Number

If you need the I/O Flex 6126's serial number when troubleshooting, the number is on :

- a sticker on the back of the I/O Flex controller board
- a Module Status report (modstat) from WebCTRL

Compliance

FCC Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

⚠ CAUTION

EQUIPMENT OPERATION HAZARD

Failure to follow this caution can result voiding the user's authority to operate the equipment.

Changes or modifications not expressly approved by the responsible party for compliance could void the user's authority to operate the equipment.

CE Compliance

⚠ WARNING

RADIO INTERFERENCE HAZARD

Failure to follow this warning could result in radio interference near by equipment.

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

BACnet Compliance

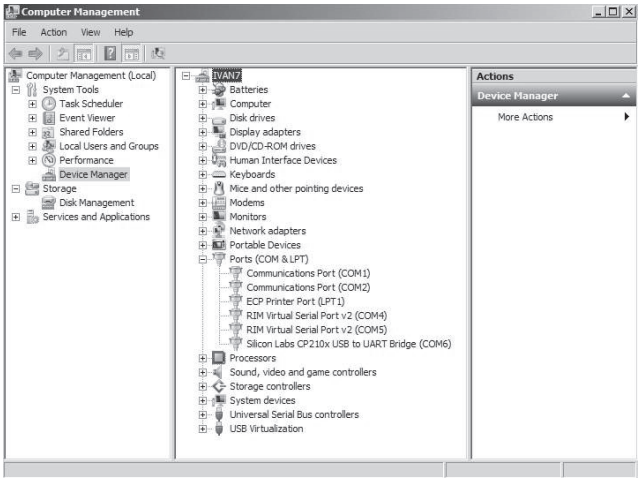
BACnet® is a registered trademark of ASHRAE. ASHRAE does not endorse, approve or test products for compliance with ASHRAE standards. Compliance of listed products to requirements of ASHRAE Standard 135 is the responsibility of the BACnet manufacturers Association (BMA). BTL® is a registered trademark of the BMA.

APPENDIX E — CARRIER BACview / VIRTUAL BACview COMMISSIONING

This appendix shows screen captures from the Virtual BACview software, however the procedure is the same regardless of which method of connection is utilized.

If you are using the handheld BACview 6, simply plug in the brown R-net connector at the end of the cable to the "Rnet Local Access" port on the I/O Flex 6126. The connector is keyed and polarity sensitive. It should fit in only one way.

If you are using the Virtual BACview Software with the USB-K connection cable, use the 4-pin adapter and not the round barrel connector. After you've installed the software, plug the cable into any USB port on your laptop and after the adapter has been detected and installed, go to the device manager to make a note of the COM port number the USB adapter got mapped to. Fig. 34 shows an example of this screen and in this case the COM port is COM 6.



C12798

Fig. 34 - COM Port Used Example

After you've made a note of the COM port number, launch the Virtual BACview software. Fig. 35 shows the initial screen.

C12799

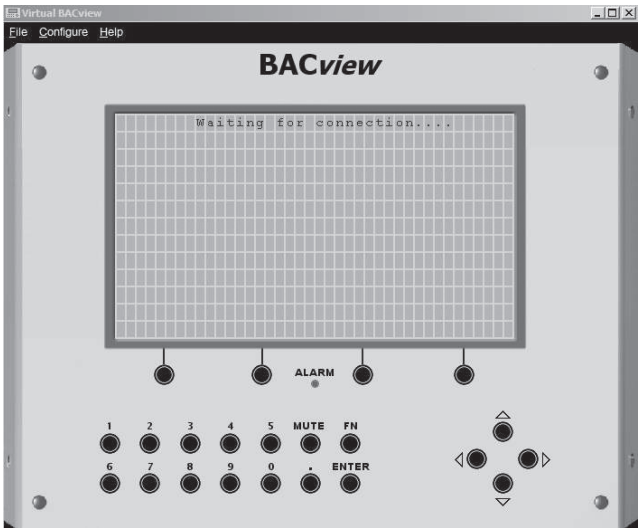
Fig. 35 - Virtual BACview Connection - Startup Settings

If you want to simulate the handheld BACview performance, leave the Row Count value set to 4 as that is the number of lines on the handheld BACview screen. It is recommended that you increase this number as it will make the navigation a bit easier.

Select the appropriate COM port number from the previous step in the pull down window and click OK.

From this point on, the directions for the Handheld BACview and the Virtual BACview Software are the same.

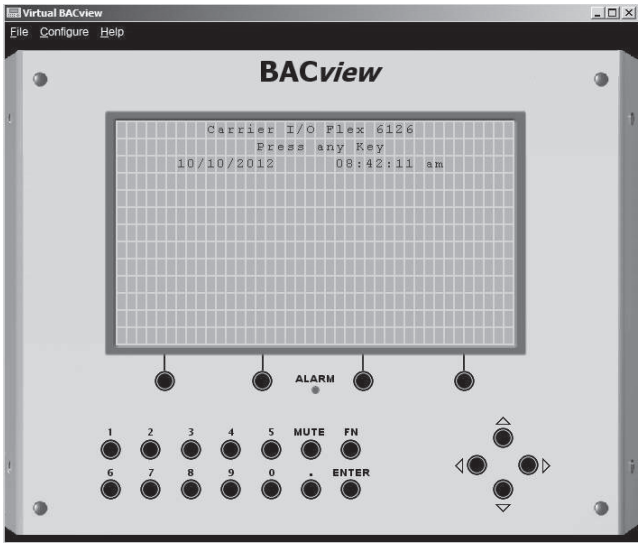
Upon initial connection, BACview displays the message shown in Fig. 36.



C12800

Fig. 36 - Waiting for Connection

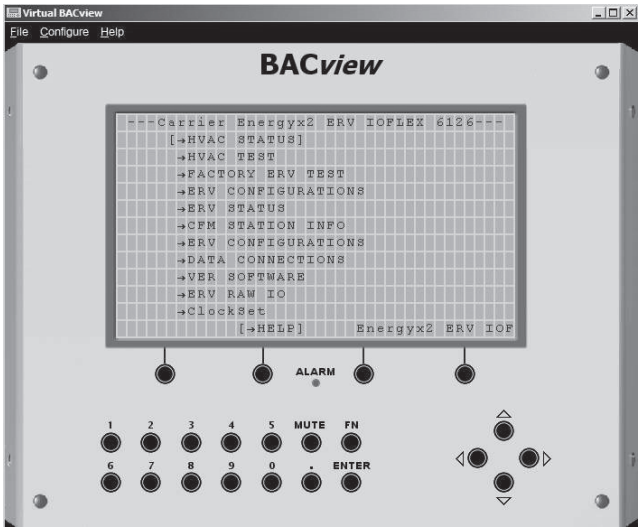
After a few seconds the Stand By screen, as seen in Fig. 37, appears.



C12801

Fig. 37 - BACview Stand By Screen

Press any key and you will see the HOME screen as pictured in Fig. 38.



C12802

Fig. 38 - Home Screen with Main Menu Displayed

Using the arrow keys you can navigate up and down this selection list.

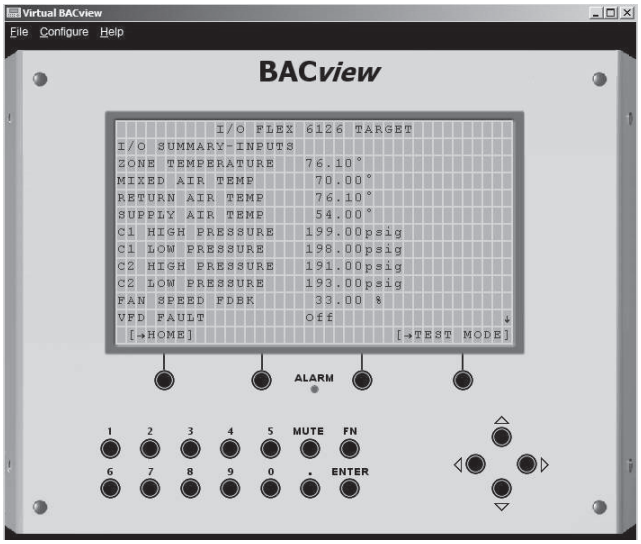
To see the current values of sensor readings and output states of the main RTU select HVAC STATUS.

To put the RTU into a TEST mode and exercise the outputs, select HVAC TEST.

To put the ERV into a TEST mode and exercise the outputs, select FACTORY ERV TEST.

The rest of the options are additional status screens which you may select if interested.

To view the HVAC Status, select HVAC STATUS; the screen in Fig. 39 appears.



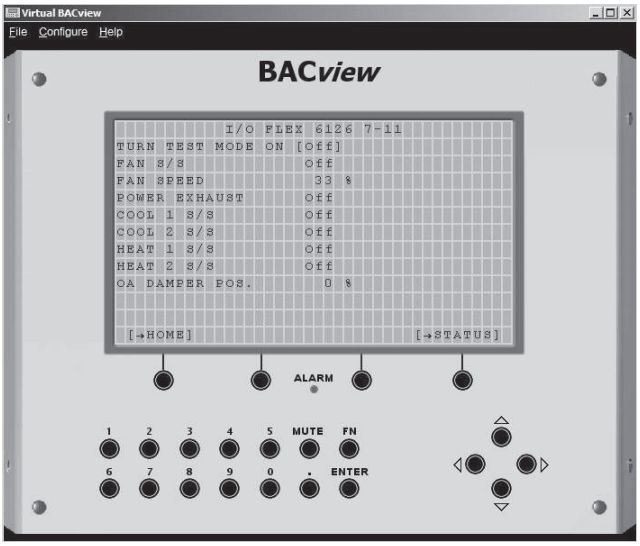
C12803

Fig. 39 - HVAC Status Screen

You can scroll down the list to see all input and output statuses.

Select HOME to go back to the main menu or TEST MODE to go to HVAC TEST.

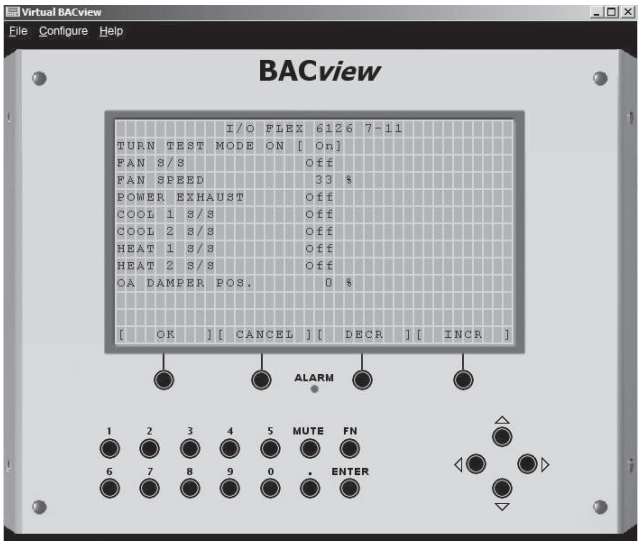
If you pick TEST MODE, the screen shown in Fig. 40 appears.



C12804

Fig. 40 - HVAC Test - Initial Screen

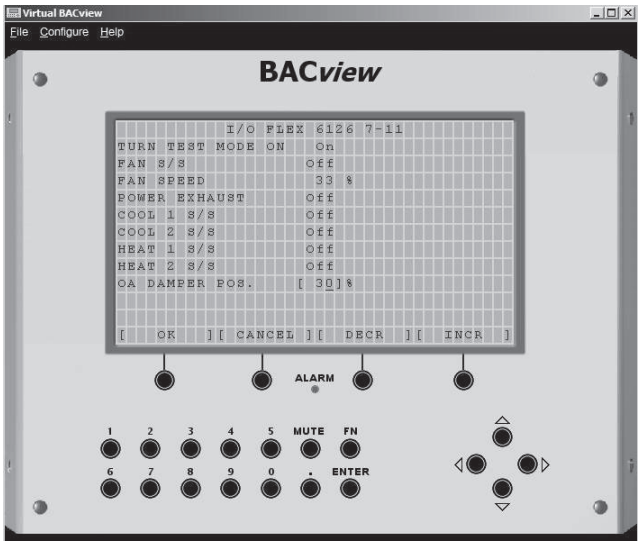
To start the test, place the cursor on the TURN TEST MODE ON, and press ENTER. The screen shown in Fig. 41 appears.


Virtual BACview
File Configure Help
BACview
I/O FLEX 6126 7-11
TURN TEST MODE ON [On]
FAN S/S Off
FAN SPEED 33 %
POWER EXHAUST Off
COOL 1 S/S Off
COOL 2 S/S Off
HEAT 1 S/S Off
HEAT 2 S/S Off
OA DAMPER POS. 0 %
[OK][CANCEL][DECR][INCR]
ALARM
1 2 3 4 5 MUTE FN
6 7 8 9 0 . ENTER

C12805

Fig. 41 - HVAC Test - Test Mode On

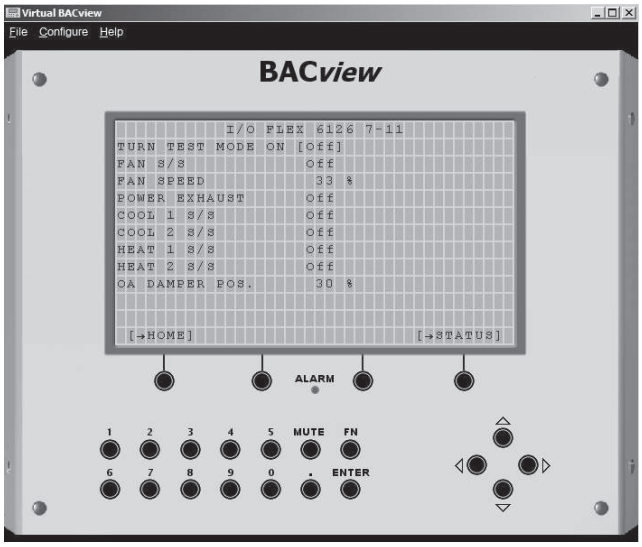
The function keys below the screen give you the option to OK the change, CANCEL, DECREMENT or INCREMENT the value. To turn the TEST MODE ON, Increment the value by 1, (change from OFF to ON) and press ENTER. The RTU will go into TEST MODE and the outputs of the I/O Flex 6126 will reflect the values seen on the screen. As Fig. 42 shows, you can scroll up and down and make additional changes to the output states in order to test them.


Virtual BACview
File Configure Help
BACview
I/O FLEX 6126 7-11
TURN TEST MODE ON On
FAN S/S Off
FAN SPEED 33 %
POWER EXHAUST Off
COOL 1 S/S Off
COOL 2 S/S Off
HEAT 1 S/S Off
HEAT 2 S/S Off
OA DAMPER POS. [30]%
[OK][CANCEL][DECR][INCR]
ALARM
1 2 3 4 5 MUTE FN
6 7 8 9 0 . ENTER

C12806

Fig. 42 - Value Changed (OA DAMPER POS)

When you are done testing the outputs, change the TURN TEST MODE ON variable to OFF and click ENTER to turn off the test mode and put the RTU in AUTO mode (see Fig. 43).



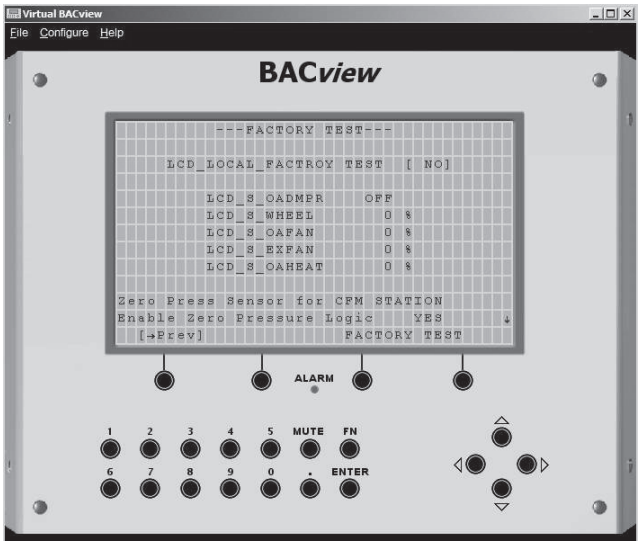
C12807

Fig. 43 - HVAC Test Completed

To run the ERV Test, from the Home screen (see Fig. 38) select FACTORY ERV TEST and then press ENTER. The screen shown in Fig. 44 appears.

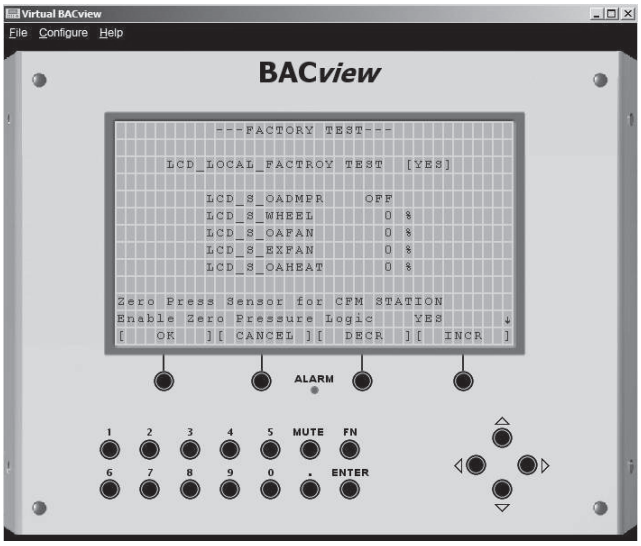
To start the test, select and change LCD_LOCAL_FACTORY TEST variable to YES (see Fig.45).

After this, you can change the values for any of the ERV outputs, thus controlling the Wheel operation as well as the speed of the OA and EX fans (see Fig. 46).



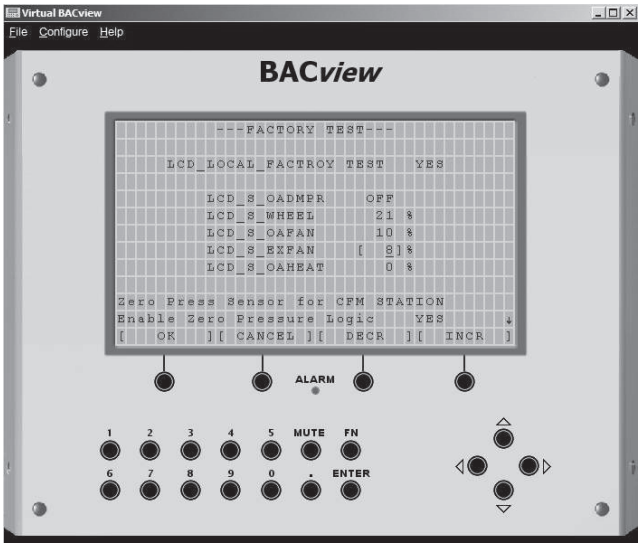
C12808

Fig. 44 - Initial ERV Test Screen



C12809

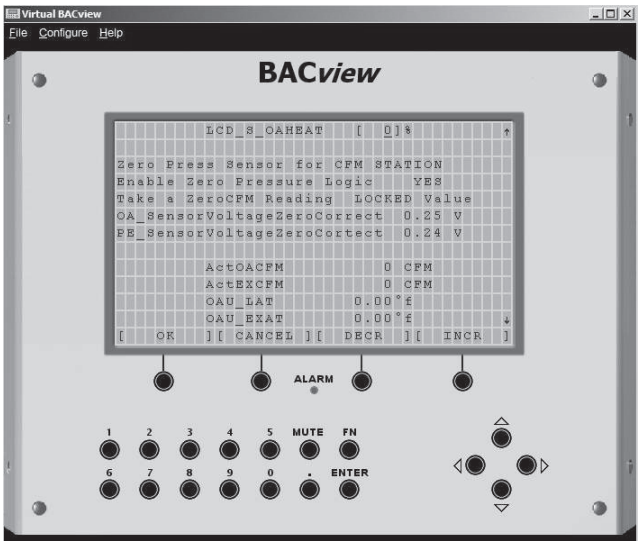
Fig. 45 - LCD_LOCAL_FACTORY_TEST set to YES



C12810

Fig. 46 - ERV Output Values Entered

To see the effect on the CFM readings your test values are having, scroll down the screen and look at the current Flow readings (see Fig. 47).

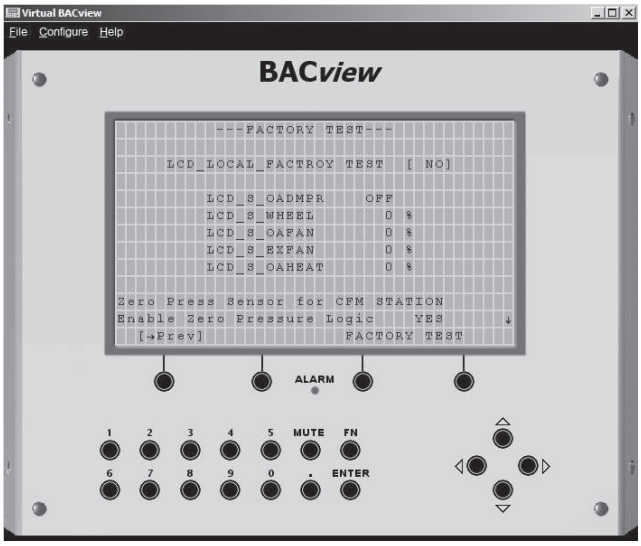


C12811

Fig. 47 - Scroll Down to View CFM Readings

After completing the ERV test, it is important to reset all values to the defaults and to turn off the test mode. If you do not turn off the test mode, the ERV will not operate properly.

Turn off the TEST mode on the top of the ERV TEST screen by setting LCD_LOCAL_FACTORY_TEST to NO (see Fig. 48).



C12812

Fig. 48 - ERV Test Mode OFF

At this point you can simply disconnect from the I/O Flex 6126 and the RTU will continue operating in AUTO mode.

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Replaces: New

ENERGYX UNIT START-UP CHECKLIST

(To be used in conjunction with base Rooftop Unit Start-Up Checklist. Remove and Store in Job File)

RTU MODEL NO.:_____ RTU SERIAL NO.:_____

ERV MODEL NO.:_____ ERV SERIAL NO.:_____

DATE:_____ TECHNICIAN:_____

I. PRE-START-UP (insert checkmark in box as each item is completed)

- ☐ VERIFY THAT ALL PACKAGING MATERIALS HAVE BEEN REMOVED FROM UNIT
- ☐ VERIFY INSTALLATION OF OUTDOOR AIR HOODS
- ☐ CHECK THAT AIR FILTERS ARE CLEAN AND IN PLACE ON SUPPLY AND EXHAUST OF ERV WHEEL
- ☐ CHECK THAT OUTDOOR AIR INLET SCREENS ARE IN PLACE
- ☐ VERIFY CONFIGURAITON VALUES FOR ELECTRONIC CONTROLS

II. START-UP (REFER TO UNIT SERVICE/MAINTENANCE MANUAL FOR START-UP INSTRUCTIONS)

ELECTRICAL

SUPPLY VOLTAGE*	L1-L2_____	L2-L3_____	L3-L1_____
ERV SUPPLY FAN-1 AMPS	L1-L2_____	L2-L3_____	L3-L1_____
ERV EXHAUST FAN-1 AMPS	L1-L2	L2-L3	L3-L1

*Distribution Block on 575v units will be 460v

TEMPERATURES

OUTDOOR-AIR TEMPERATURE (OAT) _____F dB (Dry Bulb)

RETURN-AIR TEMPERATURE (SPT or RAT) _____F dB/F wB (Dry Bulb/Wet Bulb)

ERV INTAKE LEAVING AIR TEMPERATURE (LAT) _____F

ERV EXHAUST AIR TEMPERATURE (EXAT) _____F

GENERAL

- ☐ MINIMUM DAMPER POSITION SET TO “0”
- ☐ ERV MINIMUM VENTILATION POSITION PER JOB REQUIREMENTS
- ☐ VERIFY ENERGY RECOVERY WHEEL IS ROTATING
- ☐ VERIFY SUPPLY AND EXHAUST BLOWER FANS ROTATING IN PROPER DIRECTION
- ☐ VERIFY ALL EXTERNAL PANELS FULLY SHUT AND LATCHED
- ☐ VERIFY NO ACTIVE ALARMS
- ☐ FOLLOW ALL ACCESSORY START-UP PROCEDURES

III. CONFIGURATION (Used in conjunction with Base Unit start-up configurations)

Minimum DCV Outside Air CFM _____

Minimum Outside Air CFM _____

Exhaust Air Offset CFM _____

Building Pressure Setpoint _____

Frost Protection Dial Setpoint _____

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